Helsinki Studies in Education, number 117

Yanling Cao

Teacher educators in the academic university context

The relationship between research-teaching integration, approaches to teaching, self-efficacy beliefs in teaching and burnout

To be presented, with the permission of the Faculty of Educational Sciences of the University of Helsinki, for public discussion in Metsätalo Hall 1, Unioninkatu 40, on Thursday 30 September 2021, at 10 o'clock.

Helsinki 2021

Reviewed by
Associate Professor Hanna Järvenoja, University of Oulu
Professor Mirjamaija Mikkilä-Erdmann, University of Turku

Custos
Professor Auli Toom, University of Helsinki

Supervised by
Dr Liisa Postareff, Principal Research Scientist, Häme University of Applied Sciences; Title of Docent, University of Helsinki
Professor Auli Toom, University of Helsinki
Professor Sari Lindblom, University of Helsinki

Official Opponent
Professor A. Lin Goodwin, University of Hong Kong

Cover
Yanling Cao

Unigrafia, Helsinki

ISSN 1798-8322 (print)
ISSN 2489-2297 (online)
ISBN 978-951-51-7402-4 (paperback)
ISBN 978-951-51-7403-1 (pdf)

University of Helsinki, Faculty of Educational Sciences
Helsinki Studies in Education, number 117

Yanling Cao

Teacher educators in the academic university context
The relationship between research-teaching integration, approaches to teaching, self-efficacy beliefs in teaching and burnout

Abstract
This dissertation explored teacher educators' research and teaching work in the academic university-based teacher education context. The aims were to clarify how the university-based teacher educators considered their roles as teachers and/or researchers and the nexus between their research and teaching, how they integrated research into teaching, and the approaches to teaching they reported applying. Meanwhile, how their research-teaching integration was correlated to their reported approaches to teaching, i.e., their intentions for teaching and the strategies supporting the intention, was investigated. Furthermore, how teacher self-efficacy beliefs in teaching and burnout (inadequacy in teacher-student interaction, and exhaustion and stress) predicted teacher educators' reported approaches to teaching were examined to explain the variation of their approaches to teaching. A mixed-methods approach was applied. Accordingly, a questionnaire including 34 quantitative items and one qualitative open-ended question was used. The data were collected from Finland (n = 101) and China (n = 115) and were analysed in three sub-studies.

Study I explored Finnish teacher educators' reported roles as teachers/researchers, the closeness of their research-teaching nexus, the tangible forms in which they integrated research into teaching, the approaches to teaching they reported applying, and the relationship between them. The results revealed that about half of the participants reported their roles of being more as teachers than researchers. About 80% of them considered the nexus between their research and teaching to be tight. Six forms of research-teaching integration were found. The most frequently reported form was *teaching content is based on research*, followed by *teaching methods and course design are based on research*, *applying inquiry-oriented methods in teaching*, *acting as researchers in teacher education*, *encouraging student teachers' involvement in research work*, and *a supportive relationship between research and teaching*. Furthermore, Finnish teacher educators were identified as having three approaches to teaching: *teacher educators with a student-focused approach to teaching*; *teacher educators with a dissonant approach to teaching*; and *teacher educators with a vague approach to teaching*. However, no relationship was found between the varied approaches to teaching

and teacher educators' reported teacher/researcher role, their research-teaching closeness, or research-teaching integration.

Study II examined Chinese teacher educators' reported approaches to teaching, their roles as teachers/researchers and research-teaching closeness, and the relationship between them. The analyses indicated that the Chinese teacher educators reported differently from their colleagues in Finland regarding the components of the student-focused and teacher-focused approaches to teaching. Chinese teacher educators considered information presentation as one element of the student-focused approach to teaching rather than the teacher-focused approach. Besides this, the analyses showed three approaches to teaching in Chinese teacher education similar to the ones in Finland. Meanwhile, about half of the Chinese teacher educators reported themselves more as teachers than researchers, and that their research and teaching were tightly related. Furthermore, Study II revealed that the teacher educators with a student-focused approach to teaching reported a closer research-teaching nexus than the ones with a less student-focused approach.

Study III investigated how teacher self-efficacy beliefs in teaching and burnout predicted approaches to teaching among Chinese teacher educators. It was shown that self-efficacy beliefs in teaching were positively related to the student-focused approach to teaching and explained most of the variance in this approach. Teacher educators' experiences of inadequacy in interaction with students explained most of the variance in the teacher-focused approach to teaching; meanwhile, it was positively correlated to both the student-focused and teacher-focused approaches to teaching. Teacher educators' experiences of exhaustion were negatively correlated with their student-focused approach to teaching. No relationship was revealed between teacher stress and approaches to teaching.

This dissertation contributes to the literature on research-teaching nexus in academic university-based teacher education by revealing the forms of teacher educators' research-teaching integration. Furthermore, it adds new knowledge on how we might understand teacher educators' approaches to teaching within the different cultural contexts. The results indicate that the research-teaching nexus and approaches to teaching are complex phenomena bound to the particular contexts, and the teachers situated in the context. Research and teaching can be seen as interrelated activities in academic teacher education. Different strategies are needed for teacher educators to build an integrated research-teaching nexus according to the varied roles they have reported and the forms of research-teaching integration they have applied. Meanwhile, an improvement of self-efficacy belief in teaching is vital for teacher educators to promote approaches to teaching towards a student-focused way. Taking precautions to prevent teacher educators' experiences of burnout is necessary, though the interaction between teacher burnout and approaches to teaching is complex.

Keywords: teacher educators, research-teaching integration, research-teaching nexus, approaches to teaching, self-efficacy beliefs in teaching, teacher burnout, research-based teaching, academic university-based teacher education, teacher education in Finland and China

Helsingin yliopisto, Kasvatustieteellinen tiedekunta
Kasvatustieteellisiä tutkimuksia, numero 117

Yanling Cao

Opettajankouluttajat yliopistossa
Opetuksen ja tutkimuksen integrointi, opetukselliset lähestymistavat, pystyvyysuskomukset ja uupumus

Tiivistelmä
Tässä väitöskirjassa tutkittiin opettajankouluttajien tutkimus- ja opetustyötä akateemisesssa yliopistollisessa opettajankoulutuksessa. Tavoitteena oli tutkia, miten yliopistossa työskentelevät opettajankouluttajat määrittelivät roolinsa opettajina ja/tai tutkijoina sekä tutkimuksen ja opetuksen välisen yhteyden, miten he integroivat tutkimusta opetukseensa, ja millaisia lähestymistapoja opetukseen he raportoivat. Lisäksi tutkittiin opettajankouluttajien tutkimuksen ja opetuksen integraation sekä opetuksellisten lähestymistapojen yhteyttä. Edelleen tutkittiin, miten opettajankouluttajien minäpystyvyys opetuksessa ja uupumus (riittämättömyys opettaja-opiskelijavuorovaikutuksessa, ekshaustio ja stressi) ennustivat opettajankouluttajien opetuksellisia lähestymistapoja ja niiden variaatiota. Tutkimuksessa hyödynnettiin mixed methods -tutkimusotetta. Tutkimuksessa kerättiin kyselyaineisto, johon sisältyi kvantitatiivinen osuus (34 kysymystä) ja kvalitatiivinen osuus (yksi avoin kysymys). Aineistot kerättiin Suomesta (n = 101) ja Kiinasta (n = 115), ja aineistot analysoitiin kolmessa osatutkimuksessa.

Ensimmäisessä osatutkimuksessa tutkittiin suomalaisten opettajankouluttajien rooleja opettajina/tutkijoina, tutkimuksen ja opetuksen välisen yhteyden tiiviyttä, tutkimuksen ja opetuksen integroimisen muotoja, opetuksellisia lähestymistapoja joita he raportoivat hyödyntävänsä, sekä näiden välisiä suhteita. Tulokset osoittivat, että noin puolet osallistujista raportoivat roolistaan ensisijaisesti opettajina. Noin 80% opettajankouluttajista raportoi tutkimuksen ja opetuksen välisen yhteyden intensiiviseksi. Tutkimuksessa tunnistettiin kuusi erilaista tutkimusperustaisen opetuksen muotoa. Opettajankouluttajat korostivat tutkimukseen perustuvaa opetuksen sisältöä, tutkimukseen perustuvia opetusmenetelmiä, tutkivien opetusmenetelmien hyödyntämistä, opettajankoulutuksen tutkimusta, opettajaopiskelijoiden kannustamista tutkimuksen tekemiseen sekä tutkimuksen ja opetuksen kiinteää yhteyttä. Tutkimuksessa havaittiin, että suomalaiset opettajankouluttajat hyödyntävät erilaisia lähestymistapoja opetuksessaan: opiskelijakeskeinen lähestymistapa, ristiriitainen lähestymistapa ja epäselvä lähestymistapa opetukseen. Tutkimuksessa ei löydetty yhteyttä erilaisten opetuksellisten lähestymistapojen, opettajankouluttajien raportoimien opettajan/tutkijan roolien, eikä tutkimuksen ja opetuksen integroimisen välillä.

Toinen osatutkimus tarkasteli kiinalaisten opettajankouluttajien raportoimia opetuksellisia lähestymistapoja, heidän roolejaan opettajina/tutkijoina, tutkimuksen ja opetuksen yhteyttä sekä suhdetta näiden välillä. Tutkimus osoitti, että kiinalaiset opettajankouluttajat poikkesivat suomalaisista opettajankouluttajista opetuksellisten lähestymistapojen eri ulottuvuuksien suhteen. Kiinalaiset opettajankouluttajat mielsivät tiedon välittämisen yhtenä opiskelijakeskeisen lähestymistavan ulottuvuutena opettajakeskeisen lähestymistavan sijaan. Kiinalaiset opettajankouluttajat hyödyntävät kolmea erilaista opetuksellista lähestymistapaa, jotka ovat samankaltaisia kuin suomalaisessa kontekstissa tunnistetut opettajankouluttajien lähestymistavat. Noin puolet kiinalaisista opettajankouluttajista mielsi itsensä enemmän opettajaksi kuin tutkijaksi, ja heidän tutkimuksensa ja opetuksensa olivat kiinteässä yhteydessä toisiinsa. Toinen osatutkimus myös osoitti, että opiskelijakeskeistä opetuksellista lähestymistapaa hyödyntävät opettajankouluttajat raportoivat kiinteämmästä yhteydestä tutkimuksen ja opetuksen välillä kuin ne opettajankouluttajat, joiden opetuksellinen lähestymistapa ei ollut niin opiskelijakeskeinen.

Kolmas osatutkimus tutki, miten kiinalaisten opettajankouluttajien minäpystyvyys opetuksessa ja uupumus ennustivat opetuksellisia lähestymistapoja. Minäpystyvyys opetuksessa oli yhteydessä opiskelijakeskeiseen opetukselliseen lähestymistapaan. Opettajankouluttajien kokema riittämättömyyden tunne opettaja-opiskelijavuorovaikutuksessa selitti opettajakeskeistä opetuksellista lähestymistapaa. Se oli yhteydessä sekä opiskelijakeskeiseen että opettajakeskeiseen opetukselliseen lähestymistapaan. Opettajankouluttajien kokema ekshaustio oli negatiivisesti yhteydessä opiskelijakeskeiseen opetukselliseen lähestymistapaan. Opettajankouluttajien stressin ja opetuksellisten lähestymistapojen välillä ei ollut yhteyttä.

Tämä väitöskirjatutkimus tuottaa uutta tietoa tutkimuksen ja opetuksen välisestä yhteydestä sekä tutkimusperustaisen opetuksen muodoista akateemisen yliopistollisen opettajankoulutuksen kontekstissa. Se tuottaa tietoa opettajankouluttajien opetuksellisista lähestymistavoista erilaisissa kulttuurisissa konteksteissa. Tutkimus osoittaa, miten opettajankouluttajien minäpystyvyys opetuksessa ja uupumus vaikuttavat heidän opetuksellisiin lähestymistapoihinsa. Tulokset osoittavat, että tutkimuksen ja opetuksen väliset yhteydet ja opetukselliset lähestymistavat ovat kompleksisia ilmiöitä, jotka ovat sidoksissa tiettyihin konteksteihin ja opettajiin näissä konteksteissa. Akateemisessa opettajankoulutuksessa tutkimus ja opetus ovat kiinteässä yhteydessä toisiinsa. Opettajankouluttajien erilaiset strategiat ovat tärkeitä monipuolisen tutkimusperustaisen opettajankoulutuksen rakentamisessa. Minäpystyvyydellä on keskeinen rooli opiskelijakeskeisen opetuksen organisoimisessa. Opettajankouluttajien uupumukseen on tärkeää kiinnittää huomiota, vaikkakin opetuksellisten lähestymistapojen ja uupumuksen väliset suhteet olivat tutkimuksen mukaan kompleksisia.

Avainsanat: opettajankouluttajat, opetuksen ja tutkimuksen integraatio, tutkimuksen ja opetuksen yhteys, lähestymistavat opetukseen, minäpystyvyys opetuksessa, opettajien uupumus, tutkimusperustainen opetus, akateeminen yliopistollinen opettajankoulutus, opettajankoulutus Suomessa ja Kiinassa

赫尔辛基大学，教育科学学院
赫尔辛基教育研究，No.117

曹艳玲

大学学术环境中的教师教育者
其教学科研结合方式、教学方式、教学自我效能感和职业倦怠感的关系

摘要

本博士论文探讨了大学学术环境中的教师教育者的教学和科研工作。研究的目的是厘清这些教师教育者是如何考虑他们教师和研究者的身份及其教学科研的关系，探讨了他们是如何将科研与教学相结合的，以及他们采用了怎样的教学方式。此外，本研究探索了教师教育者的教学科研结合方式与其教学方式（教学意图及教学策略）的关系，以及他们的教学自我效能感和职业倦怠感（师生互动方面能力不足、倦怠和压力）与其教学方式的关系。采用混合研究方法，本研究在芬兰（n=101）和中国（n=115）发放了一份包含 34 道量化题目和 1 道质性开放性问题的问卷。本博士研究分为三个子研究。

研究 I 探讨了芬兰教师教育者的教师/研究者身份、教学科研关系的密切程度、其教学科研的具体结合方式及教学方式，以及这些因素间的关系。结果表明，一半的参与研究的芬兰教师教育者认为他们担负的教师角色多于研究者角色；80%的研究参与者认为他们的教学科研关系十分密切。本研究共发现六种教学科研的结合方式：教学内容基于科研、教学方法和课程设计基于科研、将探究式方法应用于教学、担任教师教育的研究者、鼓励学生参与科研活动及教学科研的相互支持关系。其中，研究参与者提及最多的是第一种方式。此外，本研究发现芬兰教师教育者采用了三种教学方式：学生中心的教学方式、学生中心和教师中心混合的教学方式以及模糊的教学方式。本研究未发现芬兰教师教育者的教学方式与其教师/研究者身份、教学科研密切度或教学科研结合方式存在关系。

研究 II 探讨了中国教师教育者的教学方式、他们的教师/研究者角色和教学科研密切度，及这几者之间的关系。分析表明，中国教师教育者对学生中心和教师中心教学方式的构成要素的理解与芬兰教师教育者不同。参加研究的中国教师教育者认为，在教学时老师将知识和信息呈现给学生是学生中心教学方式的构成因素，而不是教师中心的。除此之外，数据分析显示，中国教师教育者采用了与芬兰教师教育者类似的三种教学方式。同时，将近半数中国教师教育者认为他们承担的教师角色多于研究者角色，并且，他们的教学和科研工作是密切相关的。此外，本研究表明，采用学生中心教学方式程度越高的教师教育者所报告的其教学科研的密切程度也越高。

研究 III 探讨了在中国教师教育者群体中，教学自我效能感和职业倦怠感是如何预测教学方式的变化的。结果表明，教学自我效能感与学生中

心教学方式呈正相关，并且在最大程度上解释了这一教学方式的变化；教师教育者职业倦怠感中，师生互动能力不足在最大程度上解释了教师中心的教学方式，但是这一维度与学生中心和教师中心的教学方式都呈正相关；教师教育者倦怠感与学生中心教学方式呈负相关。本研究未发现教师教育者压力感与教学方式有关系。

本博士研究揭示了教师教育者的教学科研结合方式，对探讨大学学术环境中的教师教育的教学科研关系有重大理论意义。本研究为我们理解不同文化背景中教师教育者的教学方式提供了新的理论支持。研究结果表明，教学科研关系和教学方式深深植根于其所在具体环境，并受在此环境中的教师群体的深刻影响，因此是十分复杂的现象。在学术型教师教育背景下，教学与科研是存在内在联系的活动。根据教师教育者对其自身身份的不同理解和所采用的不同教学科研结合方式，他们可以采取相应策略来建立一个融洽的教学科研关系。此外，提高教师教育者的教学自我效能感对他们教学方式向学生中心改进有至关重要的作用。本博士研究揭示了教师教育者职业倦怠感和教学方式之间的复杂关系，采取措施预防教师教育者产生职业倦怠十分必要。

关键词: 教师教育者，教学科研结合方式，教学科研关系，教学方式，教学自我效能感，职业倦怠感，研究型教学，大学学术环境中的教师教育，芬兰教师教育，中国教师教育

Acknowledgements

During my doctoral study in Finland, I have been extremely fortunate to receive extensive support and help from my supervisors, colleagues, friends, family, and many others who have inspired me. My life could not have been so wonderful without you. It's now my privilege to thank all those who have been there for me.

I first would like to express my gratitude to Professor A. Lin Goodwin from the University of Hong Kong to act as the opponent. I am honoured to have you taking the time to read this dissertation, and to have an insightful discussion in the public examination. I would like to acknowledge the pre-examiners, Associate Professor Hanna Järvenoja from the University of Oulu and Professor Mirjamaija Mikkilä-Erdmann from the University of Turku, for your valuable comments and suggestions of improvements to my dissertation.

I wish to express my sincerest and warmest thanks to my supervisors, Dr Liisa Postareff, Professor Auli Toom, and Professor Sari Lindblom. Thanks to Sari, for giving me such a fantastic opportunity to study in Finland, to meet so many great people, and to have a whole different life experience. Thanks to you all, Liisa, Auli and Sari, for all the constant feedback, professional guidance, and support despite your busy schedules. Thank you for believing in me. Your warm and continuous encouragement throughout my study meant a lot to me. Accomplishing the doctoral study and the dissertation is a critical part of my life. More importantly, from you, I have learnt how to be a researcher with professionalism, passion, enthusiasm and sincere beliefs in the work, and at the same time be a teacher who is thoughtful, caring and always ready for help. I really admire you as talented scholars and great people.

Furthermore, I want to thank all the members of the Centre for University Teaching and Learning (HYPE) at the University of Helsinki. I will always remember our casual talks and the emotional support I have received. I thank the ones in our HYPE research seminars for sharing your knowledge and thinking, and for your comments on and help with my study and the articles. A big thank you goes to Milla and Tarja for your help with my questionnaire in the Finnish version. Thank you Yusuke, it has been a great honour to share the office with you. I admire you as a talented researcher with passion and persistence. I wish to express my gratitude to Bettina for helping me with all the matters relating to my study and stay in Finland. Every time I email you, I always get instant and warm responses. I sincerely appreciate all of these.

I would like to thank all my dearest friends in Finland and the ones who have moved abroad. Yurui, Yan and Xiaoxu, you are the family I have in Finland. Thanks to Haiqin, Yufan, and Liyuan, for being friends that I can rely on. Shuanghong, Xin Tang, Wendan, Gaoming, Peixin, and Wenzhong, to name a

few, thank you for always being there for me. I appreciate the laughter we have shared, the cherished moments in our 'lunch club', as well as the conversations in which we have supported each other. Friendship will forever be the treasure that I cherish.

I also would like to express my deepest thanks to my master's degree supervisor, teachers at the Northeast Normal University, and many others who have helped me with my questionnaire and data collection in China. Dear Associate Professor Xin Chen, you have introduced me to academia. Thanks for encouraging me to pursue my doctoral degree in Finland. I would have never had such a great life experience without your unconditional support. A warm thank you goes to Associate Professor Feng Suo, and Associate Professor Geyang Zhou, for helping me prepare for studying in Finland and all the encouragement and support. Thank you, Professor Congman Rao and Associate Professor Ronghua Liang, for the supportive conversations we have had. You have taught me how to be a caring teacher to the students.

I express my thanks to the Chinese Scholarship Council (CSC) for the scholarship granted to me to support my study. I am also thankful to the Doctoral School in Humanities and Social Sciences at the University of Helsinki for their financial support for my dissertation completion and the travel grants. I would like to thank the editor Ian Dobson from the Language Centre at the University of Helsinki for the language check on my dissertation, and many others who have helped me with my dissertation and the public examination. It would have been impossible to finish my doctoral study without all the support.

I would like to thank my parents. I know I can pursue my dream without hesitation because you will always support me with endless love. I am strong and confident because I know you are always there for me.

To those not listed here because of space constraints, words to express my appreciation are limited, but my heart will always be grateful for having you in my life.

This is an exceptional period with the pandemic. Life always comes with uncertainties, which means that there will be obstacles, and surprises as well. What we can do is to be prepared, have the courage and make the endeavour to pursue what we would like to achieve. Live a life, not with regrets but with gratitude.

Helsinki, June 2021
Yanling Cao
曹艳玲

List of original publications

This doctoral dissertation is based on three original publications, which are referred to in the text by their Roman numerals (Studies I, II and III):

I Cao, Y., Postareff, L., Lindblom-Ylänne, S., & Toom, A. (2021). A survey research on Finnish teacher educators' research-teaching integration and its relationship with their approaches to teaching. *European Journal of Teacher Education*. https://doi.org/10.1080/02619768.2021.1900111.

II Cao, Y., Postareff, L., Lindblom-Ylänne, S., & Toom, A. (2019). Teacher educators' approaches to teaching and connections with their perceptions of the closeness of their research and teaching. *Teaching and Teacher Education*, 85, 125-136. https://doi.org/10.1016/j.tate.2019.06.013.

III Cao, Y., Postareff, L., Lindblom, S., & Toom, A. (2018). Teacher educators' approaches to teaching and the nexus with self-efficacy and burnout: Examples from two teachers' universities in China. *Journal of Education for Teaching*, 44(4), 479-495. https://doi.org/10.1080/02607476.2018.1450954.

This doctoral dissertation has been undertaken at the Centre for University Teaching and Learning (HYPE) at the University of Helsinki.

This research project was funded by the Chinese Scholarship Council (CSC) and the University of Helsinki.

List of figures

List of tables

List of appendices

Contents

1 Introduction

University-based teacher education is in a crucial position in linking teaching practices to academic research of teaching and education (Guberman, Ulvik, MacPhail, & Oolbekkink-Marchand, 2020), which reshapes teacher educators' identity as university academics (Ellis et al., 2013; Gunn, Berg, Hill, & Haigh, 2015). University-based teacher educators hold multiple professional roles, of which being a teacher of teachers and a researcher are foremost (Guberman et al., 2020). As a teacher of teachers, teacher educators are vital in promoting the quality of future teachers (Kelchtermans, Smith, & Vanderlinde, 2018). Meanwhile, as academics in higher education, they are expected and encouraged to conduct research (Murray, Swennen, & Shagrir, 2009).

How teacher educators manage their research and teaching work and connect these two activities is situated in the different national and academic contexts, shaped by the teacher education policy of the context (McNicholl & Blake, 2013; Murray et al., 2009). For instance, Finland exemplifies the research-based approach in teacher education, which has been the main theme for Finnish teacher educators in organising their teaching and make systemic connections between research and teaching for decades (Tirri, 2014; Toom et al., 2010). Meanwhile, as a rapidly developing country, China is speeding up in reforming teacher education towards professionalism and academicism (Zhou & Reed, 2005; Zhu & Han, 2006). Research is becoming an essential part of teacher education and Chinese teacher educators are facing enormous challenges in transforming their routine research and teaching activities.

Regardless of the diversity of teacher education practices internationally, teacher educators face the requirements to manage their dual roles and the relationship between their teaching and research duties (Gunn et al., 2015). Complexity is evident in the research-teaching nexus because it is context-specific, distinguished not only in the national contexts, but disciplinary fields with the different knowledge base, curriculum design, the ways teachers teach and students learn, and the individual teachers' perceptions (Griffiths, 2004; Healey, 2005a; Healey & Jenkins, 2006). In teacher education, teaching is being enhanced by moving towards inquiry-oriented and evidence-based with a research orientation. The recognition is growing that research is an important component of teacher education practices and is beneficial for preparing reflective practitioners (Flores, 2018; MacPhail & O'Sullivan, 2019). Thus, institutional and individual endeavours have been made trying to examine the research-teaching nexus in teacher education and its relevance in forming teacher educators' teaching (Flores, 2018; Hökkä, Eteläpelto, & Rasku-Puttonen, 2012; MacPhail & O'Sullivan, 2019).

How teacher educators practise research-teaching nexus relates to their approaches to teaching (Brew, 2002, 2003; Healey, 2005a; Hu, Van Der Rijst, Van Veen, & Verloop, 2014), namely their intentions for teaching and the strategies to support the intention (Trigwell, Prosser, & Taylor, 1994). Researchers identified two broad categories of approaches to teaching in the student-focused and teacher-focused dimensions (Trigwell et al., 1994). Meanwhile, the dissonance is revealed in the way that teachers combine these two approaches in teaching (Postareff, Katajavuori, Lindblom-Ylänne, & Trigwell, 2008; Stes & Van Petegem, 2014). Approaches to teaching are dependent on the context (Prosser & Trigwell, 1997); teachers adopt varied approaches to teaching according to the specific teaching situations, and the students with different approaches to learning (Gregory & Jones, 2009).

Teaching in teacher education is particular in its own way that it is about how to teach (Berry, 2009). Teacher educators explain abstractive professional knowledge and demonstrate the skills of teaching and learning to student teachers (Celik, 2011). Furthermore, they are essential in supporting student teachers to form their teaching beliefs and teacher identity. Considering student teachers as the teacher-to-be, teacher educators need to consider the student teachers' future students and the demands concerning teaching and learning in schools while teaching (Guilfoyle, Hamilton, & Pinnegar, 1997). Meanwhile, student teachers are encouraged to conduct research (Lunenberg, 2010). Correspondingly, as researchers, teacher educators are expected to teach their students about the knowledge and skills of research, guide their students to conduct research (Geerdink, Boei, Willemse, Kools, & Van Vlokhoven, 2016; Lunenberg, 2010; Smith, 2011), and to have an exploring spirit towards teaching work (Toom et al., 2010). The complexity of teaching in teacher education requires teacher educators to make an explicit link between the educational theory, research and teaching practices (Flores, 2018). Among the increasing discussion on positioning research in teacher education and teacher educators working as researchers (Geerdink et al., 2016; Hökkä et al., 2012; Murray & Vanassche, 2019), there has been insufficient study on tangible examples of teacher educators integrating research and teaching.

The complicated teaching situations teacher educators face and the demanding work in teacher education require them to have the corresponding competencies to fulfil their responsibility (Celik, 2011; Koster, Brekelmans, Korthagen, & Wubbels, 2005). Teacher educators are expected to have self-efficacy in their ability to teach, which is indicated in previous studies that could influence their teaching (Dixon, Yssel, McConnell, & Hardin, 2014). However, they may also experience burnout (Brewer & McMahan, 2003), for example, when they cannot balance research and teaching work (Teichler & Arimoto, 2014). They may feel inadequacy in the interaction with students and exhausted at work (Pietarinen, Pyhältö, Soini, & Salmela-Aro, 2013b). To some extent, our expectancy for qualified future

teachers relies on teacher educators achieving their responsibility and providing student teachers with strong foundations for continuous professional development (Smith, 2005). Thus, it is necessary to explore how teacher educators' self-efficacy beliefs in teaching and experiences of burnout could possibly influence their approaches to teaching.

From this perspective, teacher educators in Finland and China, and others in a wider international context, share similar issues and concerns (Van Der Klink, Kools, Avissar, White, & Sakata, 2017). For instance, they need to manage the research and teaching tasks concerning how much time and energy to put in (Coate, Barnett, & Williams, 2001). Thus, they might face obstacles in balancing the components of their work, which may worsen the situation of their research-teaching nexus and impede their work. Whether and how the universities can provide teacher educators with sufficient support to engage in research and teaching is another concern (Lunenberg, 2010; Martinez, 2008; Zhu, 2010). Hence, the study contextualises the phenomenon in Finland and China as the typified academic teacher education contexts, aiming to contribute to the international literature on teacher educators' research-teaching integration, how this integration relates to their approaches to teaching, and how their self-efficacy beliefs in teaching and experiences of burnout influence their approaches to teaching to cultivate future generations of teachers. The intention is to provide new knowledge to institutions and individual teacher educators to build an integrated research-teaching nexus and work efficiently.

2 Theoretical framework

In a general sense, teacher educators are those who educate student teachers and contribute formally to the learning and development of student teachers and teachers (European Commission, 2013). Within the broad definition, this group of professionals includes teachers working in educational institutions from universities to schools (Swennen, Jones, & Volman, 2010). They face students with varied study goals and expectations (Swennen et al., 2010), and undertake multiple tasks and professional identities (Dengerink, Lunenberg, & Korthagen, 2015). Teacher educators constitute a heterogeneous group with a diverse background, work experience and expertise (Dengerink et al., 2015; European Commission, 2013).

This doctoral thesis focuses on teacher educators of academic and university-based pre-service teacher education programmes in Finland and China. Dengerink et al. (2015) identified six professional roles of teacher educators, of which teacher of teachers and researcher are the two prominent ones. It is especially the case for teacher educators of the present study, who work in the academic university context. On one hand, they teach student teachers and supervise student teachers' teaching practice. They greatly influence student teachers' professional development in the teaching profession and how student teachers teach and behave when they become teachers in future (Lunenberg, Korthagen, & Swennen, 2007). On the other hand, teacher educators are professional researchers, their research contributes to the development of the education profession in general (Davison, Murray, & John, 2005; Murray, Czerniawski, & Barber, 2011; Swennen et al., 2010).

2.1 Teacher educators in academic teacher education

Teacher educators work in the teacher education system located in the local, national and international contexts which impact their roles and responsibilities (Ellis, McNicholl, Blake, & MCnally, 2014; Guberman et al., 2020; Moon, 2016; Murray et al., 2009; Vanassche et al., 2015). Various measures and policies have been taken under different ideologies in the political and social contexts worldwide concerning the academisation of teacher education, positioning research in teacher education and teacher educators working as academic researchers (McNicholl & Blake, 2013; Murray et al., 2009; Murray & Vanassche, 2019). How teacher educators' research and teaching are related is affected by the value-orientation of the institutions and nations (Coate et al., 2001), and thus is changing in different conditions (Brew & Boud, 1995; Griffiths, 2004; Healey, 2005a). For example, in Finland, Norway, Canada and China, teacher educators' engagement in research and their research-teaching nexus have been emphasised, especially after teacher education moved into higher education institutions (Gunn, Hill, Berg,

& Haigh, 2016; Toom & Husu, 2021). Researchers have illustrated how research and teaching are related to each other and how the research-teaching nexus influences teachers' teaching and research, as well as their students' learning (Colbeck, 1998; Healey, 2005b; Robertson, 2007).

To understand how teacher educators' research-teaching nexus shapes their pedagogy, we first need to explore how they perceive their research-teaching nexus and integrate research and teaching (Robertson, 2007). Teachers may value the ideal of research-teaching nexus and integration highly but perceive difficulties in doing so in real settings (Hu, Van Der Rijst, Van Veen, & Verloop, 2019). There might be a difference between what teachers perceive and what they do (Neumann, 1992; Verburgh, Elen, & Lindblom-Ylänne, 2007). Further measures to enhance teacher educators' research-teaching nexus can be taken by deepening our understanding of how and what teacher educators have already done in practice (Guberman et al., 2020).

Teacher educators working in the research-intensive contexts aim at delivering high-quality research-based teaching and research (McMahon, Forde, & Dickson, 2015). Teaching is a 'complex and theoretically informed practical activity' (Timperley, Wilson, Barrar, & Fung, 2007). Teachers are expected to approach teaching with a strong theoretical research base as a foundation in the particular teaching context and integrate the theory with their teaching consistently (Timperley et al., 2007). Furthermore, teaching in teacher education is particular in its own way because teaching is both about 'what teaching is' and about 'how to teach'. It is far more complicated than teaching in schools because teacher educators have to acquire not only the knowledge about the subject, school teaching and learning, but especially the knowledge of how student teachers learn to become teachers, furthermore help student teachers to understand the nature of teaching and learning (Berry, 2009), and how to support learning. In academic university-based teacher education (Ellis et al., 2014), teacher educators teach based on the expertise they already have as academic researchers. Thus, their teaching is blended with research-based and evidence-based orientations (Gunn et al., 2015, 2016). To teach in teacher education, teacher educators need to make explicit connections between their own teaching, theory, previous research, and student teachers' future teaching (MacPhail et al., 2019).

Research-teaching integration in teacher educators' work

How university teachers perceive and implement the research-teaching nexus is related to how and what they perceive as research and teaching, which reflects their conceptions of knowledge and how knowledge is generated and communicated (Brew, 1998, 1999, 2003; Brew & Boud, 1995; Brew & Phillis, 1997; Griffiths, 2004; Robertson, 2007; Trigwell & Prosser, 2009). Robertson (2007) explored teachers' academic experience and suggested that how they conceive

knowledge in the discipline influences their epistemologies, which are an important factor in shaping their experiences of research, teaching and learning, and research-teaching nexus. Meanwhile, how teachers link research and teaching is related to how they teach and expect their students to learn. In a study exploring the role of research in the teaching of university teachers, it showed that the more they view teaching as student-focused, the more highly they value the role of research in teaching. This study indicated a systematic positive relationship between the student-focused approach to teaching and beliefs about the role of research in ideal teaching (Hu et al., 2014).

Healey (2005a) developed a model to illustrate how curriculum can be designed under the different understandings of the research-teaching nexus. In the model, teaching activities shift from student-focused to teacher-focused, meanwhile, the students' experiences vary from as participants in the activity or audience (vertical axis). Either the research content or the research processes and problems are emphasised in teaching (horizontal axis). The vertical and horizontal axes form four kinds of teaching (Healey, 2005a; Figure 1). Students' effective learning experiences need all four kinds of teaching, but the top half in the figure should be emphasised more (Healey & Jenkins, 2006).

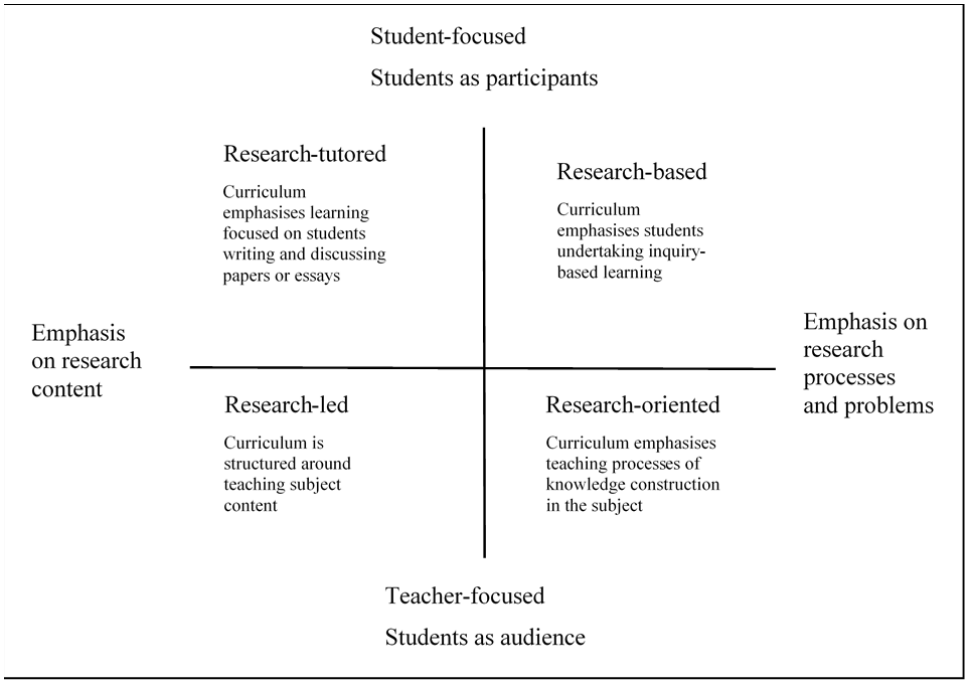


Figure 1. Curriculum design and the research-teaching nexus (Healey, 2005a).

Brew (2002, 2003) identified two models of the research-teaching relationship. In the first model, knowledge is seen as objective and separate from the knowers. Thus, teaching is the transmission of information from teachers to students, and

research is seen as publications. Research and teaching can happen independently. In the second model, knowledge is constructed in a socio-political context. Teaching is regarded as being student-focused and conceptual change, and a deep approach to learning is encouraged. Research is seen as the development of meaning and takes place in an academic community of practice (Brew, 2002, 2003).

The changing nature of research and teaching leads to the dynamic and complex nature of the research-teaching nexus (Brew & Phillis, 1997). Neumann (1992) distinguished the research-teaching nexus at three levels. At the tangible level, teachers transmit current knowledge to students, use relevant examples from their research in teaching, and useful techniques that the teachers used in research are taught to students. At the intangible level, teachers focus on students' development in their approaches and attitudes towards knowledge. Students are encouraged to be involved in research. Finally, at the global level, the research-teaching nexus is described as the relationship between the total research involvement and the teaching activity of the department (Neumann, 1992). Griffiths (2004) clarified the research-teaching nexus in three dimensions. Firstly, it can be in specific forms meaning that teachers incorporate specific research projects into teaching; or the research-teaching nexus can be more diffuse, such as by teachers enriching teaching with a general orientation generated from the research experience. Secondly, either research is weakly embedded in teaching, or they are more strongly integrated. Finally, the direction of the nexus could be unidirectional or reciprocal (Griffiths, 2004). While previous studies more often mentioned the influence of research on teaching, how teaching affects research is spoken about relatively rarely (Coate et al., 2001; Harland, 2016; Robertson, 2007). Robertson (2007) described teachers' experiences of research-teaching nexus progressing from a weak relationship in which research and teaching are unrelated, to an integrated relationship meaning that research and teaching are inseparable. Teaching and learning are experienced differently from teachers transmitting knowledge to students, to students learning in an inquiry process.

How teachers implement the research-teaching nexus and integrate research into teaching have been explored and revealed in specific forms (Griffiths, 2004; Healey, 2005b). Visser-Wijnveen and her colleagues (2010) investigated the ideal images of research-teaching nexus of academics from the field of humanities and found five profiles of research-teaching nexus: *teach research results*, *make research known*, *show what it means to be a researcher*, *help to conduct research*, and *provide research experience*. They further analysed the five profiles from the dimensions: whether the nexus is tangible or intangible, unidirectional or reciprocal; whether students are audience or participants (learn about research or participate in research); and the kind of research included in the curriculum (e.g., research content or process, research in general or current research, disciplinary research or teachers' own research) (Visser-Wijnveen et al., 2010). In a later study, they revealed five ways that teachers integrate research into their real teaching of

a course: *using the teacher's own research to illustrate the subject matter*, *focusing on the researcher's disposition and position*, *introducing students to literature after which students conduct research projects*, *follow in the teacher's footsteps*, and *participation in the teacher's research*. How the students perceive the learning outcomes in these corresponding research-teaching integration situations were further analysed. The researchers pointed out that how teachers integrate research into teaching reveals their teaching goals in the course, the teaching approaches they use to achieve the goals and the learning environment they intend to design for their students (Visser-Wijnveen, Van Driel, Van Der Rijst, Visser, & Verloop, 2012).

How teacher educators approach their research and connect research and teaching in the academic teacher education context is recognised as a critical issue in teacher education (MacPhail et al., 2019; Murray & Vanassche, 2019). Besides acquiring the knowledge of the specific subject, didactics, and pedagogy to teach, teacher educators have a wide range of knowledge and expertise about research (Koster & Dengerink, 2001; Lunenberg, 2010; Smith, 2005). They have strength in conducting research because they work in overlapping areas between school teaching, university teaching and teacher education (Griffiths, Thompson, & Hryniewicz, 2010; MacPhail et al., 2019). Teacher educators' research range from small-scale research design, like self-study, to large-scale and multimethod studies (Lunenberg, 2010). Their research is likely to cover broad themes of teaching and teacher education, and other subject fields (Lunenberg, 2010; Yogev & Yogev, 2006). Teacher educators can take their courses as research sites to explore the problems they encountered in teaching (Cochran-Smith, 2005). They can conduct self-study to explore their own teaching, improve the understanding of how the knowledge of teaching about teaching develops, and promote their reflective teaching (Berry, 2004; Dinkelman, 2003; Lunenberg, Ponte, & Van De Ven, 2007; Lunenberg & Willemse, 2006). Teacher educators not only generate practical knowledge about their own teaching, as educational professionals of the scholarly community, but they also contribute to the policy and practice of educating teachers (Goodwin et al., 2014; Smith, 2005; Swennen et al., 2010). They link the theory to their own and their students' experiences (Goodwin et al., 2014; Smith, 2005). Engaging in research activities influences teacher educators' perceptions of their roles and is seen as one approach to their professional development (Tack & Vanderlinde, 2019). Furthermore, students are encouraged to participate in research-related activities or research directly as part of the academic community (Jusoh & Abidin, 2012). By engaging in research, the students could acquire a set of highly valued competencies (Elen, Lindblom-Ylänne, & Clement, 2007). Therefore, a research-teaching nexus is required not only for the sake of teachers' teaching but also for their students' learning (Brew, 2010).

Ideally, the relationship between research and teaching is enriching. However, some studies concluded that there is little or no correlation between research and

teaching (Hattie & Marsh, 1996, 2004; Ramsden & Moses, 1992), though researchers argued that these studies are flawed because they diminish research as research productivity and teaching as teaching effectiveness (Robertson, 2007; Verburgh et al., 2007). Nonetheless, research and teaching are not always perceived as being positively related (Coate et al., 2001; Elen et al., 2007; Healey, 2005a). Keeping a balance between teaching and research is hard (Teichler & Arimoto, 2014). Teachers may have perceptions of their own roles and priority work, and others may have expectations about what teachers should do (Martin, 1997). Teacher educators are required to be more research productive and to be able to supervise their students' research (Geerdink et al., 2016; Hökkä et al., 2012; Lunenberg, 2010; MacPhail & O'Sullivan, 2019). Meanwhile, the requirements for teacher educators to develop high-quality teaching are no less important (Hökkä et al., 2012).

Whether teacher educators being more research-active or teaching-active should not be the argument discussed. Rather, how to build an enriching relationship between their research and teaching is the main concern. Teachers may prefer to do both research and teaching because they believe research and teaching are mutually enhanced (Robertson, 2007). Teacher educators need to merge the multiple roles systemically, integrate the different work within the limited time and energy they have, and bring out joint activities in which they can achieve both their teaching and research goals (Colbeck, 1998). The exploration of how teacher educators perceive their research-teaching nexus and integrate their research and teaching in the particular Finnish and Chinese teacher education contexts could provide some evidence for this discussion.

Teacher education and teacher educators in Finland

The Finnish school system and education have been the subject of academic interests all around the world. The excellent results in PISA are attributed to the high-qualified teachers (Tryggvason, 2009), who are educated within the high standards of Finnish teacher education (Tirri, 2014). The decentralisation in education since the 1970s gives teachers autonomy in teaching, at the same time, requires them to have a thorough knowledge of their work (Tirri, 2014; Toom & Husu, 2012; 2018).

Finnish teacher education has applied a research-based approach since the 1970s when teacher education established its academic status at universities. The research-based approach means that teacher education is supported by scientific knowledge and practice. All the courses are integrated with research (Hökkä & Eteläpelto, 2014; Toom et al., 2010). Educational knowledge courses, teaching practice and educational research methods are systemically organised in the programmes (Kansanen, 2014). Student teachers appreciate this research-based teacher education (Aspfors & Eklund, 2017; Byman et al., 2009; Jyrhämä et al.,

2008; Jyrhämä & Maaranen, 2012; Niemi & Nevgi, 2014). It prepares them with pedagogical thinking and the ability to make educational decisions based on rational argumentations (Kansanen, 2003; Toom et al., 2010; Westbury, Hansén, Kansanen, & Björkvist, 2005). Student teachers are encouraged to familiarise themselves with scientific research and to conduct their own research. However, they are not educated as researchers, but as future teachers who are able to work with different learners and fulfil their learning needs with suitable teaching (Krokfors et al., 2011; Toom et al., 2010). Teachers need to have the capacity to use research and research-related competencies for developing their teaching and learning (Tryggvason, 2009). The research-based teacher education educates student teachers to be critical and reflective future teachers with an inquiring attitude to the teaching profession (Kynäslahti et al., 2006; Toom et al., 2010).

Finland does not have nationally issued standards for teacher educators concerning their professional knowledge and capacity (Tryggvason, 2012). Finnish teacher educators have high levels of autonomy in their work, as other university academic staff have. They perform research and teaching in accordance with the research-based approach in teacher education (Tirri, 2014). Finnish teacher educators are teachers and researchers (Niemi, 2016). Most of them have education as their primary discipline, and practically all the teacher educators have teaching qualification in Finnish schools and/or pedagogical competence from universities (Tirri, 2014). They teach what they study, or that their teaching is based on knowledge generated from research (Krokfors et al., 2011). One concern in Finnish teacher education is the linking of educational theory with practice (Säntti, Puustinen, & Salminen, 2018), and it is suggested that it could be started with teacher educators' applications for updated pedagogical methods in their own teaching (Tryggvason, 2009). One study explored Finnish teacher educators' goals in teaching and revealed that they apply a range of approaches to teaching, aimed at modelling the different teaching to their students, helping the students to find their own teaching style and to be reflective and critical in teaching work (Tryggvason, 2009).

Finnish teacher educators see teaching as their main duty, but they also recognise the benefit of engaging in research, and further integrating research into their teaching. Research is a vital part of their professional identity (Tryggvason, 2012). Finnish teacher educators have the knowledge of research and the capacity to conduct research. They normally have a PhD degree and are academic professionals publishing research in leading international journals (Tirri, 2014). However, Finnish teacher educators experience an imbalance between the commitment of their professional identity as teachers and researchers (Hökkä & Eteläpelto, 2014).

The research-based approach in teacher education is a response to the requirement of educating teachers to be professionals with continuing professional development and life-long learners (Tirri, 2014). Finnish teacher educators appreciate it but have different understandings of what it means (Toom et al., 2008;

Tryggvason, 2012). The research-based approach is realised differently in specific matters (Krokfors et al., 2011). Furthermore, researchers have concerns about how to make the research-based approach more relevant to teachers' teaching profession (Aspfors & Eklund, 2017). The research-based approach should be more explicit to teacher educators and student teachers (Aspfors & Eklund, 2017; Byman et al., 2009; Krokfors et al., 2011).

Teacher education and teacher educators in China

Since the 1990s, a series of official documents and policies concerning teacher education have been released. A reform of teacher education aimed at improving the educational credentials and quality of teachers and establishing the professionalism of teaching and teacher education has been launched (Dai & Goodwin, 2013; Han, 2012; Rao, 2013; Zhou, 2014; Zhu & Han, 2006). Meanwhile, a curriculum reform at the primary and secondary school levels started in 2001 sets new requirements for education changing from quantity-oriented to quality-oriented (Tan, 2017), which then requires changes in teacher education to support student teachers' development in the new orientation (Lo, 2019; Rao, 2013; Ye, Zhu, & Lo, 2019; Zhu, 2010). Whether teacher education reform will succeed and make a difference in the quality of future teachers depends largely on teacher educators' perceptions of and actions to implement the reform (Zhu, 2010). Thus, how teacher educators in China approach teaching and other work under the new circumstances is attracting researchers' attention.

Chinese teacher education has been developed in the subject-centred model, in which the subject matter knowledge is emphasised over professional education knowledge. In this model, teaching is seen as transmitting knowledge from teachers to students. The preparation for student teachers to teach the subject knowledge in classrooms and handle the students' learning needs is insufficient. Moreover, Chinese teacher educators enter teacher education more as professionals at the academic level than 'teachers' at the teaching level. Lacking university pedagogy learning may present a challenge to teacher educators when they teach student teachers (Zhou, 2014). For many years, teacher education in China has been criticised for its lecture-based and teacher-focused teaching methods, outdated content knowledge and insufficient teaching practice (Dai & Goodwin, 2013; Guo, 2005; Lo, 2019).

Learner-centred and practice-oriented learning in teacher education is now emphasised (Ministry of Education of the People's Republic of China, 2011; Ye et al., 2019). Various teaching methods are recommended in teacher education to relate theoretical knowledge to educational practice (Rao, 2013; Zhou, 2014). Teacher educators are seen as facilitators of student teachers' learning. They are encouraged to teach in a more student-focused and constructive way to enhance student teachers' initiative, problem-solving skills and creativity (Guo, 2005;

Zhou, 2014). Furthermore, teacher educators need to consider how to support student teachers to form teaching beliefs and professional identity (Sang, Valcke, Tondeur, Zhu, & Van Braak, 2012; Zhou, 2014; Zhu, 2017). Both student-focused and teacher-focused approaches to teaching have been found among Chinese university teachers (Han, Yin, & Wang, 2015; Hu et al., 2014; Leung, Lu, Chen, & Lu, 2008). It is argued that Chinese teacher educators' perceptions of and approaches to teaching are changing. However, researchers are concerned that for some teacher educators, their teaching is still mostly theory-based and 'transmission teaching' of knowledge, with no relation to school practice. They are not familiar with the new initiatives in educational reform, such as inquiry learning (Zhou, 2014).

Chinese teacher educators not only face the pressure from applying innovative educational ideas and methods in teaching, but also need to cope with the increasing workload of research (Li, 2010; Yuan & Lee, 2014). With the upgrade of teacher education institutions from three-year normal colleges[1] to four-year normal colleges and universities since the 1990s, teacher education in China is gradually being implemented in higher education institutions (Zhou, 2014; Zhou & Reed, 2005). Teachers' universities[2] are being transformed from traditional teaching training institutions to academic institutions (Zhou & Reed, 2005). Some teachers' universities aim to become research-intensive, with teacher educators being required to conduct more research (Zhu & Han, 2006). Research work, such as national research projects and academic publications on top-level journals, is an important evaluation credential for promotion and awards of academic titles, while teaching is less important (Zhu, 2010). Thus, Chinese teacher educators focus more on research than teaching (Dai & Goodwin, 2013). In this sense, the research could be a factor impeding their teaching (Tian & Lu, 2017). Previous research findings revealed that Chinese teacher educators value their roles as teachers and researchers (Yuan & Lee, 2014). Besides the external pressure pushing them to conduct research, they are willing to reflect on and seek changes in their teaching when they encounter problems in teaching (Zhu, 2010). However, they experience difficulties in linking research and teaching and have a researcher-teacher role conflict (Lai, Du, & Li, 2014; Yuan & Lee, 2014), which may lead to their emotional exhaustion and depersonalisation (Xu, 2019).

Research on Chinese teacher education is receiving attention internationally (Li, Zhu, & Lo, 2019). However, previous studies focused mainly on the historical developments, and the documents and policies of educational reforms (Han, 2012;

[1] Traditionally, teacher education in China is provided in normal educational institutions. Almost all these institutions have the term 'normal' in their names, which is derived from French (Li, 2010).

[2] The term 'teachers' university' was used when referring to normal university in China.

Li, 2012; Lu, 2019; Ye et al., 2019; Zhou & Reed, 2005). There has been a paucity of empirical studies to explore how Chinese teacher educators approach their work to respond to the educational reforms and to educate qualified future teachers (Zhu, 2010). Another research paradigm is to compare teacher education in China to the ones in Western countries. Researchers concluded that Confucian pragmatism and traditional Chinese education philosophy influence the teaching and learning in teacher education (Chan & Elliott, 2002; Hu et al., 2014; Li, 2012). For example, teachers are seen as the authority of knowledge and teaching is seen as delivering knowledge (Zhang & Zhou, 2011). Meanwhile, Western educational ideas are influencing education in China more and more over time (Hu et al., 2014; Sang et al., 2012). Chinese teacher educators express passion for education and are willing to apply the reforms advocated, such as the student-focused approach to teaching. However, they are in a dilemma between their educational beliefs and the ideas they prefer, and the actual situation they work in. Correspondingly, support for teacher educators to shift their norms of practice is lacking (Zhu, 2010).

2.2 Teacher educators' approaches to teaching

Teacher educators implement their approaches to teaching in the context of academic teacher education, in which research is perceived as having an important role, such as the research-based approach stressed in Finnish teacher education. A bulk of empirical studies have emphasised the importance of teachers on their pedagogical role to construct an effective learning environment for students. However, university teaching and learning have been changing over the past few years; researchers argue that no single approach or method of teaching could work well in every teaching context (Hunt & Chalmers, 2013). Teachers need to take the students' learning purposes, teaching-learning environment and specific discipline into consideration, then design proper teaching methods and strategies to accomplish their teaching goals. No matter what kind of approach to teaching teacher educators undertake, their research-teaching nexus and practice to integrate research and teaching will have an influence to a large degree.

Student-focused, teacher-focused and dissonant approaches to teaching

Trigwell et al. (1994) explored teachers' approaches to teaching via two dimensions: strategies that teachers adopt for teaching and the intentions underlying these strategies. After investigating the teaching of first-year university science teachers, Trigwell et al. (1994) identified five categories of approach to teaching which represent variations of teachers on the two dimensions (Table 2.2-1). The five categories then were further divided into two broad groups with different focuses either on teachers transmitting knowledge or the conception development

of students: the Information Transmission/Teacher-focused approach to teaching (ITTF) and the Conceptual Change/Student-focused approach to teaching (CCSF).

Table 2.2-1. Approaches to teaching (Prosser & Trigwell, 1997).

Focus while teaching	Approaches	Teaching intentions and strategies
Focus on teachers, or the interaction between teachers and students	Approach A	Teacher-focused strategy with the intention of transmitting information to students
	Approach B	Teacher-focused strategy with the intention that students acquire the concepts of the discipline
	Approach C	A teacher/student interaction strategy with the intention that students acquire the concepts of the discipline
Focus on students	Approach D	A student-focused strategy aimed at students developing their conceptions
	Approach E	A student-focused strategy aimed at students changing their conceptions

In the teacher-focused approach to teaching, teaching is seen as knowledge transmission from teachers to students. Teachers are leaders of the teaching process and aim to transmit the knowledge they have prepared to students. They focus on what they do in class and often assume that the students have little or no prior knowledge of the subject. Teachers holding a teacher-focused approach to teaching tend to use teaching methods based on the transmission of knowledge, such as lecturing. Students may be less active during the class and their learning outcomes are evaluated in quantitative ways. In the student-focused approach to teaching, the focus is on students and their development of understanding of knowledge. Teachers applying a student-focused approach to teaching may use similar teaching strategies as those with a teacher-focused approach, but they are more likely to challenge the students' current conceptions by criticising, questioning and discussing the teaching content with them. During the teaching process, students are seen as active learners and their learning outcomes are evaluated in qualitative rather than quantitative ways (Åkerlind, 2003; Entwistle, Skinner, Entwistle, & Orr, 2000; Gregory & Jones, 2009; Kember & Kwan, 2000; Prosser & Trigwell, 2014; Trigwell, Prosser, & Waterhouse, 1999). Similar teaching methods could be used in both the teacher-focused and student-focused approaches to teaching, the difference between the two approaches is whether teaching is directed to teachers transmitting knowledge or the conceptual development and change of students (Prosser & Trigwell, 2014).

Kember and Kwan (2000) identified the two approaches to teaching by using a motivation dimension and five strategy dimensions. Applying a learning-centred approach to teaching, teachers consider motivating students as an important part

of their teaching. In their teaching strategy, they prefer to use students' own experiences as examples to encourage the students to discover knowledge. Teachers pay attention to students' needs as individuals and correct their weaknesses, and the assessment is flexible. On the contrary, with a content-centred approach to teaching, teachers do not think highly of students' internal motivations but rely more on external motivations. Therefore, they prefer to use examples from their own experiences and give students clear notes. They do not pay attention to the students' individual differences and prefer frequent tests (Kember & Kwan, 2000; Figure 2).

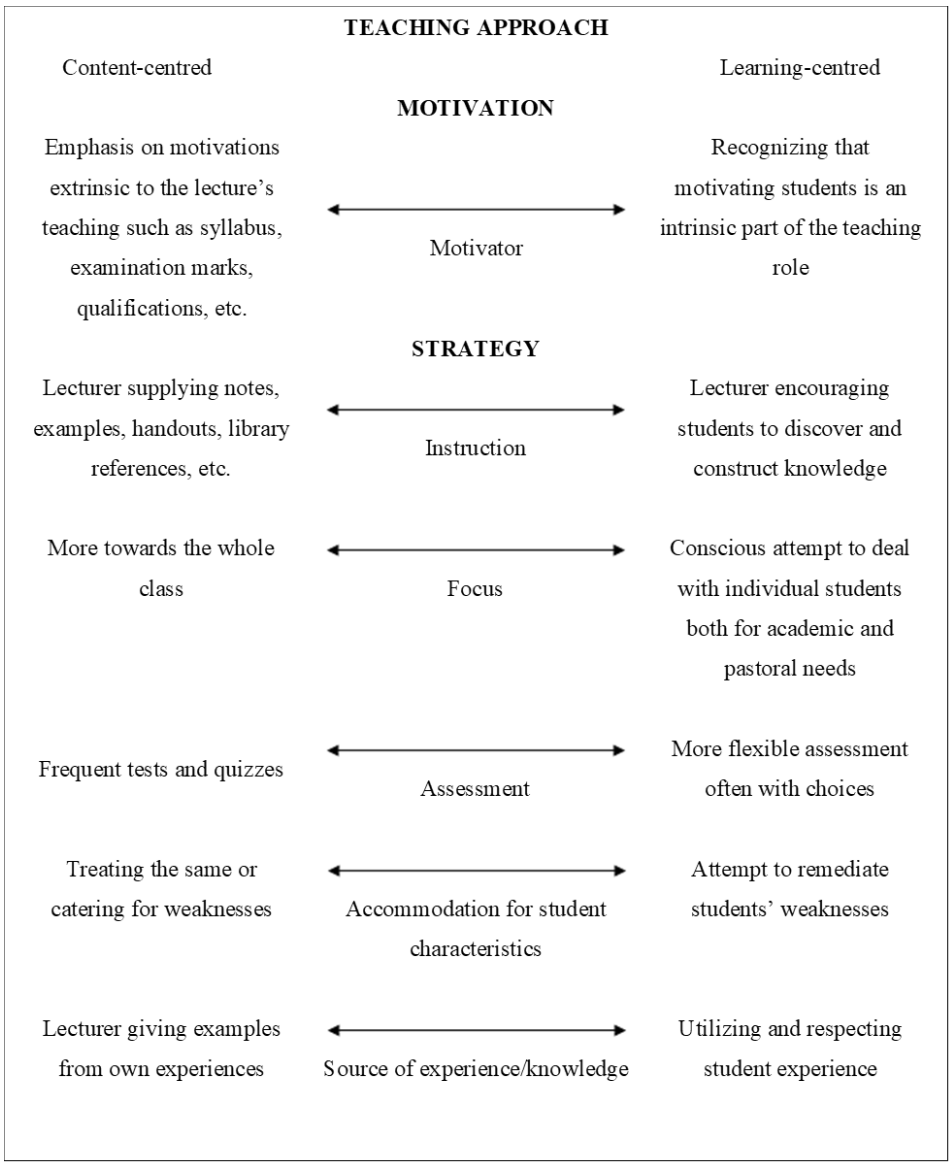


Figure 2. Components and dimensions of approaches to teaching (Kember & Kwan, 2000).

Trigwell and his colleagues' studies (1994, 1999) are like Kember and Kwan's (2000). They all analysed approaches to teaching by using intention/motivation and strategy dimensions. In Postareff and Lindblom-Ylänne's study (2008) about university teachers' conceptions of and approaches to teaching, they identified ten aspects of teaching at a general level by qualitatively analysing teachers' descriptions of their teaching. They further grouped these ten aspects into four broader aspects: (1) teaching process; (2) learning environment; (3) conception of learning; and (4) pedagogical development. Teachers' approaches to teaching are defined as either learning-focused or content-focused, and the descriptions of their teaching vary on these ten aspects (Table 2.2-2).

Table 2.2-2. Variation in the descriptions of teaching (Postareff & Lindblom-Ylänne, 2008).

Four broader aspects of teaching	Ten aspects of teaching
Teaching process	Planning of teaching
	Teaching practices
	Assessment practices
Learning environment	Teachers' role
	Students' role
	Interaction
	Atmosphere
Conception of learning	
Pedagogical development	Development of one's own teaching
	Pedagogical awareness

Researchers share similar identifications, although they use different terms to describe the essence of the two approaches to teaching. The qualifiers such as 'teacher-focused', 'teacher-centred', 'content-centred', 'content-oriented' or 'content-focused' are used to refer to the approach to teaching in which teachers focus on themselves and the content while teaching. Terms like 'student-focused', 'student-centred', 'learning-centred', 'learning-oriented' or 'learning-focused' are applied to describe the approach to teaching in which teachers focus especially on students' learning and conceptual development while teaching (Åkerlind, 2003; Entwistle et al., 2000; Kember & Kwan, 2000; Postareff et al., 2008).

The studies mentioned above provide a basis for the enquiry into the relationship between these two approaches to teaching, while contradictory opinions are presented. With a different epistemology, researchers have different opinions over the stability of approaches to teaching (Kemp, 2013). Some researchers hold an 'either/or' opinion and think that the student-focused and teacher-focused approaches to teaching are in the form of a continuum and each one represents one end of the pole (Kember, 1997; Kember & Kwan, 2000). Teachers apply either teacher-focused or student-focused approaches in their teaching and this tendency

is relatively stable. However, others think that the two approaches are two separate categories. There is an assumption that teachers who adopt a student-focused approach to teaching may also apply elements from the teacher-focused approach in their teaching. However, it is unlikely that a teacher who is heavily teacher-focused in teaching will apply elements of a student-focused approach in her/his teaching (Postareff, 2007; Trigwell, Prosser, & Ginns, 2005). Thus, the student-focused approach to teaching is seen as completer and more sophisticated (Trigwell et al., 2005). In other words, it is possible that teachers do not always teach consistently with one approach; they may apply elements from both approaches in their teaching.

In a study involving 97 university teachers from Finland, Postareff and her colleagues (2008) investigated how teachers combine the two approaches in teaching and identified consonant and dissonant profiles of approaches to teaching. Two profiles are named consonant. In these, teachers' teaching strategies and conceptions are theoretically systematic in either content-focused or learning-focused approaches. Two profiles are revealed as being dissonant. In the 'systematically dissonant' profile, teachers show a combination of content-focused and learning-focused teaching conceptions and strategies. In the other dissonant profile named 'towards learning-focused profile', teachers hold a learning-focused teaching conception but combine the content-focused and learning-focused elements in teaching strategies. Teachers in this profile are typically in a development process of teaching from content-focused to learning-focused (Postareff et al., 2008). The consonance and dissonance in approaches to teaching have also been noted in other studies (Prosser, Ramsden, Trigwell, & Martin, 2003; Stes & Van Petegem, 2014; Uiboleht, Karm, & Postareff, 2016).

The variation and change of approaches to teaching

University teaching and learning remains a complex issue to explore because they are contextually dependent and vary according to different teaching contexts, individual teachers and students. One example is the 'paradox of the Chinese learner' pointed out by Watkins and Biggs (1996). In traditional Western understanding, memorisation is a rote learning method for learners to enhance their memory of the learning content to pass exams. It is not related to deepening learners' understanding of the content, which thus is a surface approach to learning. However, Chinese learners believe that understanding is a slow process requiring a lot of hard work, thus they apply memorisation and repetition in learning to develop a deep understanding of the subject and accomplish conceptual development (Chen, 2015; Li & Cutting, 2011; Watkins, 2000). In this sense, memorisation enables learners' deep approach to learning. The 'paradox' shows that educational conceptions in learning could be understood differently in Western coun-

tries and China (Chan & Rao, 2009; Watkins, 2000). This indicates that approaches to teaching may also be conceived differently in different contexts (Chen, 2015).

Discipline is another variable that influences teachers' approaches to teaching, though it may not always be the case (Stes, Gijbels, & Van Petegem, 2008). Lindblom-Ylänne, Trigwell, Nevgi, and Ashwin (2006) found out that teachers from hard disciplines (chemistry and physics for example) tend to apply a teacher-focused approach to teaching, and teachers of soft disciplines (such as history and anthropology; Biglan, 1973a, 1973b; Neumann, Parry, & Becher, 2002) are more likely to apply a student-focused approach. Similar findings were also reported by Kemp (2013) with 344 university teachers in Singapore, and Beausaert, Segers and Wiltink (2013) in a secondary school in the Netherlands.

The variation in approaches to teaching is related to teachers' personal factors developed from their experience of and interaction with the teaching environments. For example, how teachers perceive the teaching environment influences their approaches to teaching (Prosser & Trigwell, 2014). Compared with the teacher-focused approach to teaching, the student-focused approach is more sensitive to contextual factors (Stes et al., 2008). The student-focused approach to teaching is associated with teachers' more positive perception of the teaching environment, while the teacher-focused approach to teaching is unrelated to teachers' perceptions of the teaching environment (Prosser & Trigwell, 1997).

Besides the perceived teaching environment, Trigwell (2012) found out that there is a systematic relationship between teachers' self-reported approaches to teaching and the emotions they experience while teaching. In particular, positive emotions are more associated with the student-focused approach to teaching, whereas negative emotions are more associated with the teacher-focused approach. This relationship is not 'cause and effect' but is reciprocal. Teachers with a student-focused teaching approach may have positive emotions with their teaching because of the interaction with the students and the various teaching strategies they use. Teachers who are confident and satisfied with their teaching are more likely to communicate with the students more often and let the students 'control the class'. Similarly, teachers who experience negative emotions, such as frustration and anxiety, are more likely to choose the 'safe' way to teach and think of teaching as transmitting knowledge to the students. If the task is unfinished, they are more likely to feel frustrated and anxious. A similar result was found by Postareff and Lindblom-Ylänne (2011) when they analysed the profiles of approaches to teaching described by university teachers. Teachers with the consonant learning-focused profiles had the most positive emotions with teaching, such as enthusiasm, enjoyment and excitement, while teachers with consonant content-focused profiles had neutral or negative emotions about teaching. Some of them described not being passionate about teaching and saw teaching as an obligatory duty alongside research.

The discussion on the factors related to approaches to teaching is driven by concerns about changing teachers' approaches to teaching so that they could influence students' learning in a positive way (Beausaert et al., 2013; Prosser et al., 2003; Trigwell et al., 1999). Trigwell et al. (1999) showed that by applying the student-focused approach to teaching, teachers value the students' existing knowledge of the subject; they encourage the students to construct their own understanding of the subject. Therefore, teachers' student-focused approach to teaching is related to their students' deep approach to learning, whereas teachers' teacher-focused approach to teaching is associated with their students' surface approach to learning (Trigwell, et al., 1999). Furthermore, students' deep approach to learning is related to high-quality learning outcomes (Qureshi & Ullah, 2014; Trigwell & Prosser, 1991). Meanwhile, research has shown that teachers' consonant learn-focused approach to teaching is associated with students' better approaches to learning and learning outcomes, while teachers' dissonant approach to teaching is related to students' low quality of learning, though this is not always the case (Uiboleht, Karm, & Postareff, 2018). Thus, we may assume that teachers' consonant and student-focused approach to teaching could be an encouraging factor for students to adopt a deep approach to learning, which then leads to their high-quality learning outcomes. This is one of the reasons why teachers are encouraged to improve their approaches to teaching in a more consonant and student-focused way.

Approaches to teaching are dynamic and changes are possible (Lindblom-Ylänne et al., 2006). Pedagogical training programmes are effective initiatives taken by universities which are aiming to change and improve teachers' approaches to teaching (Gibbs & Coffey, 2004; Hanbury, Prosser, & Rickinson, 2008; Postareff, Lindblom-Ylänne, & Nevgi, 2007, 2008; Stes, Clement, & Van Petegem, 2007). With a study involving 204 Finnish university teachers, Postareff et al. (2007) reported evidence that teacher training has an effect on the change in approaches to teaching from teacher-focused to student-focused, though the process is slow. In addition, the teacher-focused approach is more stable and harder to change than the student-focused approach. However, other researchers stated that the instructional training does not have a strong effect on teachers' teaching, or that it may not always have an impact (Stes, Coertjens, & Van Petegem, 2010, 2013). Different theories and epistemology are linked to teachers' practice to approach teaching, which means that changes in their approaches to teaching first require foundational changes in their thinking and beliefs about knowledge and learning (Kemp, 2013). Thus, enormous efforts are required if teachers want to change their existing beliefs about approaches to teaching (Kember, 1997).

Teacher educators as teacher of future teachers

As prospective teachers, student teachers start their professional development when they enter the teacher education programmes. Thus, how teacher educators approach teaching would have a great influence on student teachers' learning and development of capability as teachers. A growing body of research has investigated teacher educators' everyday practice to enrich our knowledge of teaching about teaching (Ball & Forzani, 2009; Berry, 2004; Berry & Loughran, 2012; Goubeaud & Yan, 2004; Korthagen & Kessels, 1999; Lunenberg & Korthagen, 2003; Lunenberg et al., 2007; Swennen, Lunenberg, & Korthagen, 2008).

Traditionally, teaching is the main task of teacher educators (Lunenberg, 2010), and they have a strong commitment to their teacher role (Murray, 1998). Teacher educators are the ones to promote the development of knowledge of student teachers (Srinivasan, 2016). However, student teachers acquire not only the knowledge and skills of teaching but also how to practise teaching in school situations. Teacher educators teach the 'actual practice of teaching', unpacking the tasks and activities involved in teaching into constituent parts and making it learnable to student teachers, whilst avoiding reducing it to propositional knowledge and beliefs. They further provide student teachers with opportunities to practise what they have learned in real teaching settings (Ball & Forzani, 2009). Furthermore, student teachers need to know how to modify teaching according to their students' needs and different contexts. This requires them to acquire the ability to analyse educational occasions and make pedagogical decisions on their own. Accordingly, teacher educators need to implement student-focused and inquiry-oriented teaching to support student teachers take ownership of their learning and seek answers to the questions they construct (Tom, 1985). Goubeaud and Yan (2004) revealed in an empirical study with American teacher educators that they use more often student-centred teaching methods, such as discussion and group work, than teachers in other faculties do.

It is a teacher educator's job to push student teachers beyond their learning needs and encourage them to learn constructively. Meanwhile, another important but difficult task for student teachers to accomplish during their teacher education study is to transform from school students to teachers through constructing systematic beliefs and professional identity (Malderez, Hobson, Tracey, & Kerr, 2007). Student teachers have their own school experience which exerts a strong influence on their learning in teacher education (Berry, 2004; Lortie, 1975). They have developed their own beliefs about teaching during their previous learning experience before entering the teacher education programme (Kagan, 1992; Lortie, 1975; Sang et al., 2012). A development in student teachers' teaching beliefs is necessary (Nettle, 1998). Furthermore, professional identity formation in teaching is a process of student teachers redefining their professional selves as teachers. Based on the practical knowledge of teaching, student teachers integrate their conceptions of what teaching is with the interaction with the workplace context and

others (Lamote & Engels, 2010). Educating future teachers is more than preparing them for knowledge, skills, practice and behaviour, but also consider their professional identity formation at a deep level, because it is strongly related to how teachers will teach in the future (Schepens, Aelterman, & Vlerick, 2009). Teacher educators are vital in this complex process (Timoštšuk & Ugaste, 2010).

The teaching of teacher educators, i.e., second-order teaching, is different from teaching students in schools (MacPhail et al., 2019). Teacher educators teach prospective teachers about how to teach; in this respect, their teaching needs to reflect and be in accordance with teaching at all levels (Loughran & Berry, 2005). Furthermore, teacher educators are models of teaching for student teachers to observe and imitate (Lunenberg et al., 2007). Teacher educators are expected to 'teach as they preach', because student teachers not only learn from what their teachers say about how to teach but more importantly, from how their teachers actually teach (Berry, 2004). However, student teachers' learning of their teachers' teaching behaviour may not always happen because they may not recognise it as model teaching (Lunenberg et al., 2007). Thus, it is important for teacher educators to explain their pedagogical choices to student teachers to help them understand, and further to provide them with chances to practise and incorporate the experiences into their own teaching (Lunenberg & Korthagen, 2003; Lunenberg et al., 2007; Swennen et al., 2008). This requires teacher educators to reflect on and have a thorough understanding of their teaching, and to have a deep knowledge of pedagogical and educational theory, and to be able to link the relevant theory to their own and their students' teaching practice (Korthagen & Kessels, 1999; MacPhail et al., 2019; Swennen et al., 2008).

2.3 Teacher educators' self-efficacy beliefs in teaching and the relationship with approaches to teaching

Teacher educators are professionals in teaching and education (Guberman et al., 2020), and are described as the models for student teachers to imitate (Lunenberg et al., 2007). They are expected to be competent to apply various approaches to teaching and to have confidence in their competence to teach. Meanwhile, whether teacher educators have self-beliefs in their efficacy to cultivate student teachers through their teaching are important, which influences the ways they teach and their teaching performance (Kaye & Brewer, 2013; Lumpe, Vaughn, Henrikson, & Bishop, 2014). Thus, teacher educators' self-efficacy beliefs in teaching are a vital aspect to discuss when the aim is to explore their approaches to teaching.

Self-efficacy beliefs in teaching and approaches to teaching

Teacher self-efficacy beliefs are described as individual teachers' beliefs in their capacity to carry out activities to attain given educational goals (Skaalvik &

Skaalvik, 2010; Tschannen-Moran, Hoy, & Hoy, 1998). It is domain-specific, and teachers may have different levels of self-efficacy across different domains, for example in their instructional practice and classroom management skills (Perera, Calkins, & Part, 2019). Self-efficacy beliefs in teaching are personal characteristics that influence teachers' approaches to teaching in the relative domain and context (Lindblom-Ylänne et al., 2006; Tschannen-Moran et al., 1998). Teachers' self-efficacy beliefs affect both teachers' general orientation to the educational process and their specific teaching practices. They determine individuals' goal setting and commitment to it, furthermore, how they utilise the knowledge and skills to accomplish the goal (Bandura, 1993). Teachers high in self-efficacy are more likely to set higher educational goals for themselves and their students. They are willing to differentiate instructions to adjust their teaching for students with differing abilities and apply various teaching approaches to improve their students' thinking, motivation and engagement to pursue good learning outcomes (Dixon et al., 2014; Pitkäniemi, 2002). Teachers with a strong sense of teaching self-efficacy are more favourably disposed to the student-focused approach to teaching (Kaye & Brewer, 2013). They teach in constructivist and inquiry-based ways and are more open to new instructional practices. The low efficacious teachers tend to apply more of the teacher-focused approach to teaching in the traditional and 'safe' ways, such as reading- and writing-based tasks (Chichekian & Shore, 2016; Ghaith & Yaghi, 1997; Guskey, 1988; Nie, Tan, Liau, Lau, & Chua, 2013; Temiz & Topcu, 2013).

Self-efficacy beliefs are not only correlated to teachers' approaches to teaching directly, but also to their emotional feelings while teaching (Bandura, 1993), and to their persistence, enthusiasm and commitment in teaching (Allinder, 1994; Coladarci, 1992; Gibson & Dembo, 1984). A strong sense of self-efficacy enables teachers to put more time and effort to solve the problems they encountered in teaching (Lumpe et al., 2014). They are willing to pay more attention to and support students with difficulties in learning (Ashton, Webb, & Doda, 1983). Thus, they are more likely to feel strong personal accomplishments and reduced feelings of stress and depression (Bandura, 1994). However, teachers with weaker beliefs in their self-effectiveness tend to avoid challenging academic tasks. They experience more difficulties in teaching and work-related stress and are less satisfied with their job (Betoret, 2006).

Teachers' beliefs in their teaching efficacy influence their teaching-related feelings and behaviour to form the teaching-learning environment (Bandura, 1993). The more teachers believe in their own ability to have a positive effect on students' learning, the more they invest effort in teaching, and thus the more likely they are to build a stimulating learning environment for their students (Caprara, Barbaranelli, Steca, & Malone, 2006). Moreover, teacher self-efficacy is related to student learning (Mojavezi & Tamiz, 2012), and students' efficacy in learning is enhanced when their teachers have a stronger sense of efficacy in teaching

(Chang, 2015; Sarac & Aslan-Tutak, 2017). Meanwhile, students' strengthened efficacy could act as a mediating factor between the teachers' efficacy and the students' learning achievement. By positively influencing students' efficacy in learning of a specific task, the more efficacious teachers were in teaching the task, the better the students achieved in their learning outcomes (Chang, 2015).

In teacher education particularly, student teachers are provided with professional education and training to become competent and effective future teachers. Thus, it also has certain requirements for teacher educators to be competent and effective to be able to complete their work, such as teaching. More importantly, teacher educators should believe in their ability to teach and that they can make a difference in their students' learning (Gupta & Goswami, 2014). However, few studies have explored the self-efficacy beliefs of teacher educators (Attri & Devi, 2017; Gorski, Davis, & Reiter, 2012; Gupta & Goswami, 2014; Tobery-Nystrom, 2011). Using the self-study methodology, Tobery-Nystrom (2011) explored and reflected on the self-efficacy of a teacher educator to fulfil her everyday work. Gorski et al. (2012) discussed teacher educators' self-efficacy in teaching multicultural teacher education courses in the United States. Gupta and Goswami (2014) found that teacher educators with high occupational self-efficacy also have higher scores in professional effectiveness, which means that they perform their daily work as teachers effectively. Attri and Devi (2017) revealed that teacher educators' self-efficacy beliefs are positively correlated to their professional commitment. Nevertheless, how teacher educators perceive their self-efficacy in teaching and how it could influence their approaches to teaching have rarely been explored.

The change and development of self-efficacy beliefs in teaching

Previous research findings revealed that a high level of self-efficacy beliefs is important for teachers to accomplish their work. Thus, a further question is how we can improve teachers' self-efficacy beliefs. Bandura (1994) suggested four ways to develop people's self-efficacy, i.e., through mastery experience, experiences provided by social models, social persuasion, and by reducing people's negative emotions. In the field of teaching and education, teacher self-efficacy is revealed to relate to many cognitions and beliefs. It varies between teachers and within a teacher (Pitkäniemi, 2002). For example, teaching experience affects teachers' self-efficacy. The more experienced teachers have more confidence in providing sufficient instructional strategies and managing disruptive classroom situations (Taimalu, Kikas, Hinn, & Niilo, 2010; Tschannen-Moran & Hoy, 2007). Teacher efficacy is a self-perceived belief and is shaped by social forces, such as teachers' workload and work conditions (Pitkäniemi, 2002). High-quality relationships the teachers have with their students and community are an important source for them to enhance their self-efficacy beliefs (Korte & Simonsen, 2018).

The factors influencing teachers' self-efficacy beliefs have been explored. Furthermore, professional development and training programmes aimed at improving teachers' self-efficacy beliefs are carried out (Lumpe et al., 2014; Posnanski, 2002). Ross and Bruce (2007) found out that professional development programmes have a positive effect on sixth grade teachers' self-efficacy for classroom management. For teachers working in higher education, Postareff et al. (2007) revealed that pedagogical training affects university teachers' self-efficacy, though the process is slow. The results showed that the teachers who had less than one year of training scored lower than the teachers who did not have any training at all. Only after one year of training did teachers' self-efficacy reach a higher level (Postareff et al., 2007).

2.4 Teacher educators' burnout and its relationship with approaches to teaching

As mentioned in previous sections, teacher educators take an extensive responsibility in educating future teachers and they play a crucial role in optimising and maintaining high-quality education. Multiple tasks are assigned to them, and they are expected to acquire the competencies to accomplish their roles (Ben-Peretz, 2001; Celik, 2011; Koster et al., 2005; Smith, 2005). However, the demanding work and increasing workload are related to teachers' experiences of exhaustion (Kumar & Mellsop, 2013). Brewer and McMahan (2003) explored job stress and burnout among a group of industrial and technical teacher educators. They found that the participants reported a moderate level of burnout (Brewer & McMahan, 2003). The job-person fit model of burnout explains that the cause of burnout is a misfit between the individual and the job (Maslach, Schaufeli, & Leiter, 2001; McGeary & McGeary, 2012). It is possible that teacher educators are stressed and experience burnout when they are overburdened, which will then influence their well-being and teaching (McGeary & McGeary, 2012; Retelsdorf, Butler, Streblow, & Schiefele, 2010). Thus, exploring their experiences of burnout is necessary for considering their preparation for teaching and other work in teacher education.

Teacher burnout, self-efficacy beliefs and approaches to teaching

Teacher burnout and teacher stress are two related concepts that are often explored coherently in teacher well-being studies (Howard & Johnson, 2004; Kyriacou, 1987; Wisniewski & Gargiulo, 1997). Burnout is an individual experience that relates to teachers' approaches to teaching directly and indirectly through their cognitive beliefs such as self-efficacy beliefs. It was first mentioned by Freudenberger in 1974 and described as 'to fail, wear out or become exhausted by making

excessive demands on energy, strength, or resources' (Freudenberger, 1974; Kumar & Mellsop, 2013). It was originally considered as a social rather than a research issue until the 1980s when the scientific investigation of occupational burnout started to grow (McGeary & McGeary, 2012). The definitions of burnout have been developing along with research findings all the time, the most widely accepted one is a three-dimensional model: exhaustion, cynicism (also mentioned as 'depersonalisation' in some studies) and professional inadequacy (i.e., reduced personal accomplishment) (Kumar & Mellsop, 2013; McGeary & McGeary, 2012; Pietarinen, Pyhältö, Soini, & Salmela-Aro, 2013a, 2013b).

Exhaustion is the central quality of burnout (Grayson & Alvarez, 2008; Maslach et al., 2001). It occurs when an individual feels exhausted by the emotional demands of work and lack emotional energy (Maslach & Goldberg, 1998; Maslach, et al., 2001). It leads to people developing an indifference or cynical attitude and keeping a distance from the work and others, i.e., the second dimension of burnout, cynicism. Cynicism is a self-protective mechanism that helps the individual to protect the emotion and get away from the overburdening work. It is hard to feel effective when an individual feels exhausted and has negative attitudes about others. This can lead to the experience of professional inadequacy whereby an individual feels ineffective when fulfilling his/her job. The growing sense of inadequacy and a declining sense of competence may lead to a feeling of failure (McGeary & McGeary, 2012).

Teacher burnout and teacher stress are two linked but separated phenomena (Howard & Johnson, 2004). Teacher stress is teachers' experience of negative feelings or emotional problems resulting from the stressors in teacher work (Kyriacou, 1987; Salami, 2011). Burnout can be seen as one kind of job stress, but has different antecedents, correlates and consequences (Pines & Keinan, 2005). Some researchers considered teacher burnout, showing as syndromes of physical, emotional and attitudinal exhaustion, to be a result of prolonged teacher stress (Howard & Johnson, 2004; Kyriacou, 1987; Salami, 2011; Wisniewski & Gargiulo, 1997). Teachers are under a great deal of pressure from their teaching and other work, such as improving students' academic performance and fulfilling the requirements of educational reforms (Leung & Lee, 2006; McGeary & McGeary, 2012). They may experience burnout if they cannot cope with the stress successfully (Skaalvik & Skaalvik, 2010).

Teacher burnout is related to individuals' cognitive beliefs. For example, a negative relationship between teacher self-efficacy and teacher burnout was found (Friedman, 2003; Skaalvik & Skaalvik, 2010), though the models for examining the relationship are quite complicated (Friedman, 2003). Self-efficacy plays an important role in perceived burnout through its impact on other determinants and its cyclical nature (Friedman, 2003). It constitutes a source factor of burnout, and job stress operates as a mediator between them (Schwarzer & Hallum, 2008). Skaalvik and Skaalvik (2010) argued that the relationship between teacher self-

efficacy and burnout may be reciprocal. Teachers' low self-efficacy may result in burnout and experience of burnout may lead to a sense of low self-efficacy, though further studies are needed to explore the causal relationship between them (Skaalvik & Skaalvik, 2010).

It is indicated that teachers with burnout are more likely to experience diminished self-efficacy (Sutton & Wheatley, 2003). Burnout influences teachers' motivation and emotions (McGeary & McGeary, 2012; Pietarinen et al., 2013a; Retelsdorf et al., 2010). Teachers with burnout are more likely to give themselves low self-evaluation and experience more negative emotions, such as lacking confidence, depression, anxiety, anger and hopelessness (McGeary & McGeary, 2012). Thus, they tend to apply more of the teacher-focused approaches to teaching characterised as performance-oriented, which are related less to students' development of conceptual application skills (Retelsdorf et al., 2010). They have a low tolerance for dealing with challenging students and their behavioural problems (Grayson & Alvarez, 2008; Kokkinos, Panayiotou, & Davazoglou, 2005).

A recent study investigated the causal relationship between teacher burnout and teaching interactive practices by using the latter as predictive variables. It is revealed that teachers' student-centred participation practices are a negative predictor of their emotional exhaustion and low personal accomplishment. In contrast, teachers' teacher-centred practices are a positive predictor of their emotional exhaustion. One interpretation is that teachers' promotion of active participation by students in classroom activities could lead to their feeling of professional realisation and reduced burnout. Meanwhile, teachers struggling to control their interaction with students are more vulnerable to experience burnout (Mameli & Molinari, 2017).

The prevention of teacher burnout

Burnout affects teachers' choices of teaching methods and responses to students' learning needs (Grayson & Alvarez, 2008). Thus, variables relevant to teachers' experiences of burnout have been explored (Kumar & Mellsop, 2013). For example, at the individual level, age is a predicting factor of burnout. Young teachers experience more emotional exhaustion than their senior colleagues do (Lau, Yuen, & Chan, 2005). For teacher educators, demographic variables significantly predicted job stress and burnout, however, the portion of the variance of job stress and burnout that can be explained by demographic factors is small (Brewer & McMahan, 2003). At the institutional and environmental level, the overburdened working environment and social conflict may be the resources for teachers' increasing burnout (Pietarinen et al., 2013a). One study reviewed the literature on burnout among university teaching staff and indicated that research, time pressures, diminished collegiality, and teaching large classes could trigger the experience of burnout (Watts & Robertson, 2011). Working conditions, such as teaching

load and office hours, are also related to teachers' emotional exhaustion (Lackritz, 2004). Furthermore, the teacher-student relationship is one predictive factor affecting teachers' cynicism (Grayson & Alvarez, 2008). The lack of institutional support was the main stressor for teacher educators' burnout (Brewer & McMahan-Landers, 2003).

It is argued that a moderate level of stress may have a positive effect on teacher educators' work performance. However, researchers also warned that the increasing occupational stress could lead to health problems (Nagra & Arora, 2013). Teacher burnout becomes one of the factors for predicting the intention to quit teaching (Leung & Lee, 2006). It has also been noted that teacher burnout is associated with student behaviour and learning outcomes (Dorman, 2003; Wong, Ruble, Yu, & McGrew, 2017). Thus, interventions and measures to prevent teacher burnout are encouraged (Maslach et al., 2001; McGeary & McGeary, 2012). For example, previous studies suggested that teachers could learn both self- and co-regulation to regulate their behaviour to reduce burnout and construct a better working environment (Pietarinen et al., 2013a). However, individuals normally have less control over the stressors in their work environment. The situational and organisational factors play a bigger role in preventing burnout than the individual factors (Maslach, 2003). Therefore, social support from colleagues and institutions is important (Leung & Lee, 2006; Richards, Hemphill, & Templin, 2018).

2.5 Summary of the theoretical framework

Teacher educators are responsible for educating student teachers as future teachers about the complex nature of teaching and learning and help them to understand its evidence base (Smith, 2011). Though they work in their own context with differences in educational systems and policies, and teacher education practices, their work is of crucial importance is a widespread agreement internationally. As a unique group, they share some similar experiences and problems while working.

For teacher educators in Finland and China, teacher education in the university context provides them with opportunities to work with multiple roles and tasks. The external requirements in teacher education put teacher educators in a demanding work situation (Ben-Peretz, 2001). Finland has set up well-developed research-based teacher education as the main theme for teacher educators to manage their research and teaching (Toom et al., 2008, 2010). Meanwhile, their colleagues in China are facing a series of ongoing changes in the working environment because of the reform of initial teacher education (Zhou & Reed, 2005; Zhu & Han, 2006). The Chinese teacher educators are being challenged to shift their educational ideology and working routines in accordance with the initiatives introduced nationally and internationally (Guo, 2005; Hu et al., 2014; Li, 2010; Sang et al.,

2012; Ye et al., 2019; Yuan & Lee, 2014; Zhou, 2014). Teacher educators' research-teaching integration and approaches to teaching are situational phenomena explored in the two Finnish and Chinese teacher education contexts accordingly.

The study of teacher educators used to get little attention because the teaching of teaching has not been perceived as being specialised expertise as the knowledge in other fields (Berry, 2004). Thus, teacher educators were expected to learn about themselves and their work on their own as individual endeavours. However, the arguments presented in the above sections provide a theoretical basis for exploring teacher educators' work for the present dissertation study (Figure 3).

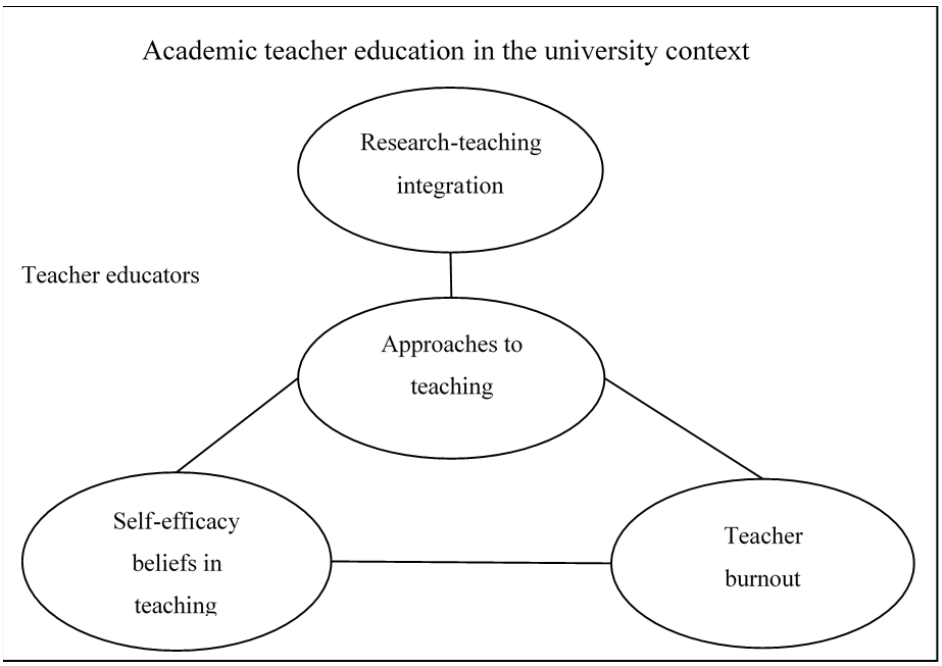


Figure 3. Summary of the theoretical framework of this doctoral thesis.

The situation for university-based teacher educators is that teaching and conducting research are their important responsibilities. A deep understanding of how they approach their teaching and research to further the development of teaching and teacher education is under request. Thus, teacher educators' research-teaching nexus and practice to integrate research and teaching are the core phenomena explored in this thesis, which reflect their perceptions of teaching and research, and their relationship with the students and the teaching environment. The student-focused approach to teaching is favoured in some studies (Postareff et al., 2007; Trigwell et al., 1999), but the dissonant approaches to teaching are found in broad teaching contexts (Postareff et al., 2008; Stes & Van Petegem, 2014; Uiboleht et al., 2016). Teacher educators need to be able to apply the various approaches to

teaching to suit the different teaching situations and student groups (Chen, 2015), which is the second main concern of the study.

The changes in the approach to teaching are related to various factors. The present thesis firstly focuses on the interaction between teacher educators' research-teaching nexus and integration, and approaches to teaching. Secondly, the study examines how their self-efficacy beliefs in teaching and experiences of burnout influence their approaches to teaching, which mirror their emotional and psychological aspects when teaching and interacting with students. Emotion acts as the internal link between approaches to teaching, self-efficacy beliefs in teaching and burnout (Bandura, 1993; Lau et al., 2005; Mameli & Molinari, 2017; McGeary & McGeary, 2012; Trigwell, 2012).

Teacher self-efficacy beliefs and burnout have been conceptualised in several contexts with various operational definitions in previous studies, which results in different measures used to assess them (Friedman, 2003). This makes it hard to interpret the research findings across different research contexts (Tschannen-Moran & Hoy, 2001). Most research on teacher self-efficacy is conducted among preservice teachers and elementary and middle school teachers. Meanwhile, though many empirical studies have explored university teachers' burnout, few studies have focused on teacher educators (Nagra & Arora, 2013). It has been pointed out that teacher efficacy is task- and context-specific (Taimalu et al., 2010; Tschannen-Moran & Hoy, 2007). Teachers perceive their self-efficacy in different situations differently (Malinen et al., 2013). Thus, as suggested in one study, domain-specific research on teachers' self-efficacy beliefs could provide teachers with context-specific suggestions concerning teaching and thus should be encouraged (Klassen, Tze, Betts, & Gordon, 2011). Internationally speaking, Chinese teacher educators' self-efficacy beliefs and experiences of burnout is an under-researched area, which needs further attention.

3 The aims of the study

The university-based teacher educators work in a teacher education context in which research and teaching interrelate and interact in complicated ways (MacPhail et al., 2019). The complexity of teacher educators' work requires a rethinking of their roles and responsibilities, and how they deliver their work (McMahon et al., 2015; Vanassche et al., 2015). Therefore, the overall purpose of this doctoral thesis is to deepen our understanding of how teacher educators consider and approach their research and teaching work. To be more precise, the aim of the study is to explore teacher educators' reported research-teaching closeness and roles as teachers and/or researchers, their practice to integrate research and teaching, and how these relate to their approaches to teaching. In addition, the study investigates how teacher educators' personal characteristics and experiences, i.e., their self-efficacy beliefs in teaching and burnout, predict their approaches to teaching.

The following research questions are addressed in three sub-studies to achieve the research aims:

1. How do teacher educators report the closeness between their research and teaching, and their roles as teachers and/or researchers? (*Studies I and II*)
2. How do teacher educators report integrating research into teaching? (*Study I*)
3. What approaches to teaching do teacher educators report adopting? (*Studies I and II*)
4. How are teacher educators' reported research-teaching closeness and teacher/researcher role related to their approaches to teaching? (*Studies I and II*)
5. How is teacher educators' research-teaching integration related to their reported approaches to teaching? (*Study I*)
6. How are their reported approaches to teaching related to their self-efficacy beliefs in teaching? (*Study III*)
7. How are their reported approaches to teaching related to their experiences of burnout? (*Study III*)

4 Methodology

4.1 Research contexts

Teacher education in Finland

In Finland, the public sector educational institutions from elementary school to higher education is financed by the government to guarantee equal opportunity and high-quality education for everyone. The development of teacher education can be traced back to the 1860s when the first teacher training college was established. The Teacher Education Act was promulgated in 1971, and in 1974, teacher education programmes for primary and secondary school teachers were incorporated into universities (Tirri, 2014; Uusiautti & Määttä, 2013).

Teacher education is now provided at eight universities in Finland and includes programmes of class teacher education, subject teacher education, home economics teacher education, craft teacher education, special education and kindergarten teacher education (Kansanen, 2003). Teachers in Finland enjoy high status as professionals and teaching is regarded as a noble profession driven by a moral purpose (Niemi, Toom, & Kallioniemi, 2012). Therefore, teacher education attracts many young talented students to apply for the study places. The competition in the entrance examination is quite hard, and only the most outstanding applicants are selected. After graduation, the students receive the formal teaching qualification and can apply for teaching positions. The graduates are qualified to work as teachers as well as researchers of education. With the master's degree, they are automatically qualified to continue to doctoral studies (Kansanen, 2014).

Finland does not have a detailed national curriculum for teacher education; the general principles of university degrees apply to the teacher education curricula. The eight universities have autonomy in organising their own teaching and research activities (Tryggvason, 2012). Student teachers are required to finish a three-year bachelor's degree (180 ECTS[3]) and a two-year master's degree (120 ECTS), including bachelor's and master's theses (but an exception is the kindergarten teachers' qualification is with a bachelor's degree) (Niemi, 2016; Tirri, 2014). Class student teachers are educated to teach grades 1-6. They major in educational sciences and minor in other disciplines. The class teacher education curriculum includes studies in educational sciences (140 ECTS including teaching practice of 20 ECTS), compulsory minor subject (60 ECTS), optional studies (75

[3] ECTS is European Credit Transfer System. One ECTS credit corresponds to 28 hours of work (Niemi & Nevgi, 2014).

ECTS) and orientation studies (25 ECTS). Secondary student teachers are educated to teach grades 7-9. They complete the major subject studies in their subject faculties and pedagogical studies in educational sciences as their minor subject (60 ECTS including teaching practice of 20 ECTS) (Niemi, 2016; Niemi & Jakku-Sihvonen, 2011). The research-based approach is an overall principle for all the teacher education programmes (Kansanen, 2003). Research elements are involved in teacher education study at the very beginning, such as literature reading and research methods courses (Krokfors et al., 2011).

This thesis study involved all the six teacher education programmes of the eight universities in Finland (some participants worked in more than one programme). Most reports were from class teacher education (n = 72) and subject teacher education (n = 43), followed by kindergarten teacher education (n = 23), special education (n = 14), craft teacher education (n = 12) and home economics teacher education (n = 8). The courses covered a broad range of content. For example, education theory like multicultural education, pedagogical studies for secondary subject teachers, subject didactics such as geography and music. Courses for research methods and thesis seminars were also involved. The class size varied from groups as small as four people to big classes involving as many as 100 students. The students' study level ranged from the first year to senior level such as the fourth year. The various teaching methods were reported, including lectures, group study and discussion, individual reading and thesis writing.

Teacher education in China

Teacher education has a long history in China, but the formal teacher education system was established in the late 1890s (Li, 2012). At the end of the 20th century, Chinese teacher education has approached its new era, starting with a new round of reform and the establishment of a series of laws and guidance (Guo, 2005; Li, 2012). The first Teachers Law was promulgated in 1993. It claimed teachers as the cornerstone of the country's educational development and specified terms to guarantee the quality of teachers (Ministry of Education of the People's Republic of China, 1993). For example, primary school teachers are required to hold at least a graduation certificate from junior normal colleges[4], and junior high school teachers need to have a bachelor's degree (Li, 2012). Meanwhile, the Ministry of Education requires teachers to obtain a teaching certificate to teach at schools of all types and levels (Ministry of Education of the People's Republic of China, 1995).

[4] Usually, junior normal colleges provide three-year teacher education programmes. Graduates are granted a graduation certificate after they successfully complete their study (Li, 2012).

Pre-service teacher education in China is mainly provided by normal educational institutions with a three-level system, namely normal schools, junior normal colleges and normal universities. Some comprehensive universities also provide teacher education programmes (Li, 2012). By 2019, 605 higher education institutions were providing teacher education, 199 are normal educational institutions, and 406 are non-normal universities and colleges[5] (Ministry of Education of the People's Republic of China, 2019). There are five national key teachers' universities[6], which are under the administration of the Ministry of Education. Meanwhile, each province has a provincial key teachers' university that is affiliated with the provincial education administration. Because of the unbalanced economic and cultural development across the huge country, different regions and provinces vary extensively concerning matters including the investment in teacher education, development of the institutional system and teacher education programmes (Yang & Wu, 1999).

Normally teachers' universities in China offer teacher education as four-year bachelor's and three-year master's programmes, and some universities also provide three to five years of doctoral programmes (Li, 2012). The undergraduate curriculum typically includes three parts: a) the general education courses such as political theories and foreign language, b) professional education courses like educational psychology, pedagogy, subject-specific teaching methodology and teaching practice, and c) subject matter courses such as mathematics and history (Zhou, 2014). A dissertation is required for a bachelor's degree (Li, 2012). The Teacher Education Curriculum Standards issued in 2011 establish the detailed guidance for institutions to develop their teacher education programmes (Rao, 2013; Zhou, 2014). They stipulate the minimum credits of the professional education courses required for student teachers. For example, they need to acquire at least 32 credits[7] to become primary school teachers (Ministry of Education of the People's Republic of China, 2011). The required total study credits vary between institutions.

This thesis includes research at two teachers' universities located in the northeastern part of China. One is a national key university and the other is a provincial key university that is in the same area as the first one. The two universities are

[5] Since the teacher education reform in 1990s, some comprehensive universities set up teacher education programmes. To distinguish them from the traditional normal educational institutions, these comprehensive universities involved in teacher education are referred as non-normal/non-teachers universities and colleges (Rao, 2013).

[6] The key universities normally receive more financial resources, and have better teachers and teaching facilities to guarantee a development priority. The aim is to achieve a higher educational outcome by providing the limited resources to some of the universities (Li, 2012).

[7] One credit corresponds to 18 study hours of the students in class under the supervision of teachers.

representatives of the high quality of teacher education in China. Nine faculties from the two universities were involved in the study, including faculties representing soft sciences such as Faculties of Education, Arts, History and Foreign Languages, and faculties representing hard sciences, like Faculties of Chemistry, Biological Sciences, Mathematics and Statistics, Physics and Geographical Sciences. The programmes were at the bachelor's level from the first to fourth years and at the master's level. The courses included professional education courses, such as educational psychology and pedagogy, and subject-specific teaching methodologies. The student number of these courses varied from a small group of four to a large group of 400. Diverse teaching methods were used in the courses, such as lectures, discussion, group work, written assignments and student presentations.

4.2 Participants

A total of 216 teacher educators participated in this thesis study, 101 teacher educators from Finland and 115 from China. The 101 Finnish teacher educators in *Study I* were from teacher education programmes of the eight universities in Finland. Thirty-eight (37.6%) came from the University of Helsinki, and 63 (62.4%) were from other universities, including the University of Tampere, University of Turku and University of Eastern Finland. Ninety-two participants gave information about their age, which differed from 26 to 71 years (M = 51; SD = 10.47). Thirty-one participants (30.7%) were male and 68 (67.3%) were female, two (2%) did not report their gender. 77.2% of the participants (n = 78) held a doctoral degree, 19.8% (n = 20) possessed a master's degree, and 3% (n = 3) did not specify their education level. The participants' teaching experience varied from one to 39 years (M = 16.16; SD = 10.71). Most Finnish teacher educators in the study (n = 93, 92.1%) had a formal teaching certificate. Twenty-eight participants (27.7%) had pedagogical training and 25 of them had credits from the training, which varied from two to 60 credits (M = 16.68; SD = 17.97). Another 72 (71.3%) did not participate in any pedagogical training during their work as teacher educators, and one did not report on his/her pedagogical training. Among the 99 participants who reported the composition of their workload (teaching, research, administration and other work adding to 100% in total), 64 (64.7%) considered themselves more in teaching than in conducting research in everyday work; 23 (23.2%) reported conducting research more than teaching; the other 12 participants (12.1%) mentioned that teaching and research took up the same amounts of time in their work.

Studies II and *III* included 115 Chinese teacher educators from two teachers' universities. Twenty-eight (24.3%) were from the Faculty of Education, and 87 (75.7%) worked in teacher education programmes in other faculties. The age of the participants varied from 26 to 54 years (M = 39; SD = 6.42). Forty-nine participants (42.6%) were male and 63 (54.8%) were female, three participants

(2.6%) did not give information about their gender. Seventy-nine (68.7%) held a doctoral degree, 35 (30.4%) had a master's degree and one (0.9%) had a bachelor's degree. One hundred and eleven teacher educators had teaching experience from one to 33 years (M = 13; SD = 7.66), 18% of them (n = 20) were early career teacher educators with a teaching experience of five years or less. One hundred and nine participants (94.8%) had a formal teaching certificate, and 105 participants' certificate was at the higher education level. Of the participants, 74.8% (n = 86) reported participating in pedagogical training ranging from three days to 12 months (M = 1.91 months; SD = 2.21); 22.6% of the participants (n = 26) did not have any training concerning their pedagogy since they became teacher educators; 2.6% of them (n = 3) did not mention their pedagogical training. For most participants (n = 61), the pedagogical training lasted one month or less. One hundred and thirteen participants reported the composition of their workload in percentage. Sixty (53.1%) confirmed teaching more than doing research, 36 (31.9%) reported doing research more than teaching, other 17 (15%) thought that teaching and research occupied equal amounts of time in their workload.

4.3 Materials

A mixed-methods approach was applied to investigate the research questions. The mixed-methods data collection strategy was applied in which qualitative and quantitative data were collected concurrently (Driscoll, Appiah-Yeboah, Salib, & Rupert, 2007). The participants responded to a questionnaire with 34 closed questions and one open-ended question. The open-ended question offered abundant qualitative responses to explain the closed questions. It further assisted the understanding of how the teacher educators in the study integrated their research into teaching in everyday practice. A summary of the questionnaire and how it was used in the sub-studies are shown in Table 4.3-1.

Table 4.3-1. Summary of the questionnaire.

Measure dimensions		No. of items	Resources	Measure scale	Utilisation in studies
Research and teaching work	Research-teaching closeness	1		Five-point Likert scale	Studies I and II
	Teacher/researcher role	1			
	Research-teaching integration	1		Open-ended question	Study I
Approaches to teaching	Student-focused	11	ATI-R; Trigwell et al., 2005	Five-point Likert scale	Studies I, II and III
	Teacher-focused	11			
Self-efficacy beliefs in teaching		4	Lindblom-Ylänne et al., 2006		Study III
Teacher burnout and stress	Inadequacy in teacher-student interaction	3	STBI; Pietarinen et al., 2013b		Study III
	Exhaustion	2		Seven-point Likert scale	
	Stress	1		Ten-point Likert scale	

Firstly, teacher educators' reported research-teaching closeness, their teacher/researcher role, and ways to integrate research and teaching were measured by three items developed by the researchers involved in this thesis study (Table 4.3-2).

Table 4.3-2. Items of teacher educators' reported research-teaching closeness, teacher/researcher role, and research-teaching integration.

1. How much do you think your research is related to your teaching?
2. To what extent do you consider yourself as a teacher and a researcher?
3. Please describe how you combine your research with your teaching; you can give specific examples here.

Secondly, teacher educators' reported approaches to teaching were explored with 22 items from the revised version of the Approaches to Teaching Inventory (ATI-R; Trigwell et al., 2005; Table 4.3-3), with 11 items on each of the student-focused and teacher-focused approaches to teaching scales.

Table 4.3-3. The revised version of the Approaches to Teaching Inventory (ATI-R; Trigwell et al., 2005).

Student-focused approach to teaching
1. In this course I try to develop a conversation with my students about the topics we are studying.
2. I set aside some teaching time so that the students can discuss, among themselves, key concepts and ideas in this subject.
3. I encourage students to restructure their existing knowledge in terms of the new way of thinking about the subject that they will develop.
4. In teaching sessions for this subject, I deliberately provoke debate and discussion.
5. I make available opportunities for students in this course to discuss their changing understanding of the subject.
6. It is better for students in this course to generate their own notes rather than copy mine.
7. A lot of teaching time in this course should be used to question students' ideas.
8. I see teaching as helping students develop new ways of thinking in this subject.
9. In teaching this subject it is important for me to monitor students' understanding of the subject matter.
10. Teaching in this course should help students question their own understanding of the subject matter.
11. Teaching in this course should support students to find their own learning resources.
Teacher-focused approach to teaching
1. In this course students should focus their study on what I provide them.
2. It is important that the course is completely described in terms of specific objectives that relate to the assessment of the course.
3. It is important to present a lot of facts to students so that they know what they have to learn for this subject.
4. In this course I concentrate on covering the information that might be available from key texts and readings.
5. I structure my teaching in this subject to help students to pass the assessment of the course.
6. I think it is important to give students a good set of notes in this course.
7. In this course, I provide the students with the information they will need to pass the formal assessments.
8. I should know the answers to any questions that students may put to me during this course.
9. In this course my teaching focuses on the good presenting information to students.
10. My teaching in this course focuses on delivering what I know to the students.
11. I present material to enable students to build up an information base in this subject.

Thirdly, four items explored teacher educators' reported self-efficacy beliefs in teaching (Lindblom-Ylänne et al., 2006; Table 4.3-4). Based on items from the Motivated Strategies for Learning Questionnaire (MSLQ; Pintrich, Smith, Garcia, & McKeachie, 1991), Lindblom-Ylänne and her colleagues developed these four correspondent items to investigate teachers' motivational aspects to teaching and regulation strategies they use (Lindblom-Ylänne et al., 2006).

Table 4.3-4. Items of teacher educators' reported self-efficacy beliefs in teaching (Lindblom-Ylänne et al., 2006).

Teachers' self-efficacy beliefs in teaching
1. I am confident that my knowledge of this subject matter is not a barrier to teaching it well.
2. I am certain that I have the necessary skills to teach this course.
3. I am confident that students will learn from me in this course.
4. I am confident that my knowledge of teaching is not a barrier to teaching well.

Finally, teacher educators' experiences of burnout were investigated by six items from the Socio-contextual Teacher Burnout Inventory (STBI; Pietarinen et al., 2013b). The STBI (Pietarinen et al., 2013b) measures teachers' socio-contextual burnout in terms of interpersonal problems in individuals' relations with others in the school context. It is based on Maslach and Jackson's (1981) burnout scale and Elo, Leppänen and Jahkola's (2003) single item of stress. The final STBI includes nine items in total: (1) cynicism towards the teacher community (three items), (2) inadequacy in teacher-pupil interaction (three items), and (3) exhaustion (two items) and stress (one item) (Pietarinen et al., 2013b). This dissertation study focused on teacher educators' experiences of burnout generated from their teaching and interaction with student teachers. Thus, three items measuring teachers' cynicism towards the teacher community were left out. The six items on inadequacy in teacher-pupil interaction, and exhaustion and stress were included in the questionnaire (Table 4.3-5). The items were modified. For instance, the word "pupil" was replaced with "student" to make the items consistent with the present higher education research context.

Table 4.3-5. Items of teacher educators' experiences of burnout.

Inadequacy in teacher-student interaction
1. Dealing with problem situations considering my students often upsets me.
2. The challenging students make me question my abilities as a teacher.
3. I often feel I have failed in my work with students.
Exhaustion
1. I feel burnt out.
2. With this work pace I don't think I will make it to the retiring age.
Stress
1. Stress means a situation in which a person feels tense, restless, nervous or anxious or is unable to sleep at night because his/her mind is troubled all the time. Do you feel this kind of work-related stress?

The item about the closeness between research and teaching was measured with a five-point Likert scale ranging from "1 = no link between them" to "5 = they are totally related". In the second item about teacher educators' roles as teachers and/or researchers, the participants gave responses as percentages ranging from "0% as a teacher and 100% as a researcher" to "100% as a teacher and 0% as a researcher". In the open-ended question, the participants presented their opinions about the research-teaching integration and gave specific examples of how they integrated research into the teaching of one of their courses. Twenty-nine items of approaches to teaching (22 items), self-efficacy beliefs in teaching (four items) and inadequacy in teacher-student interaction (three items) were measured with a five-point Likert scale varying from "1 = only rarely or never true" to "5 = almost always or always true". Two items on exhaustion were measured with a seven-point Likert scale and the single item of stress was on a ten-point Likert scale. These three items were measured as in the scales in the original inventory.

In *Study I*, English and Finnish versions of the questionnaire were used. In the Finnish version, the 22 items measuring approaches to teaching included the items retrieved from the 16-item Finnish version of the Approaches to Teaching Inventory (ATI; Trigwell & Prosser, 2004), which was used in a previous study (Postareff et al., 2007). Other items left in the English version were translated into Finnish by the supervisors of the thesis. After the translation, the Finnish version was filled in by two Finnish scholars. With their suggestions and a comparison between the original English version and the translated Finnish version, the items were slightly revised. In *Studies II* and *III*, a Chinese version of the questionnaire was applied. The 22 items of approaches to teaching were translated into Chinese by a Chinese researcher who was not involved in this thesis study. Other items were translated into Chinese by the doctoral candidate. Afterwards, the Chinese version was back-translated into English by two scholars who were fluent in both Chinese and English. The original English version and back-translated English version were compared, some word variations that were considered not to be influencing the core meaning of the items were found, and the items were modified. Furthermore, changes in terminology were made in the translations to make the questionnaire correspond to the specific research context.

The questionnaire was sent to the participants in 2015. In *Study I*, a paper version was first sent to the teacher educators at the University of Helsinki and the University of Tampere. Meanwhile, an email with the link to the questionnaire was sent to all the teacher educators at the eight universities in Finland. A reminder email was sent to them two weeks later. The participants at the University of Helsinki and the University of Tampere could respond to either the paper or the electronic version of the questionnaire, and teacher educators at the other six universities could respond to the electronic version. The Finnish response rate was 12%. In *Studies II* and *III*, the questionnaire was sent to the Chinese teacher educators in its paper version, on which the link to the questionnaire was attached.

The participants returned the questionnaire within the two-week data collection period, and the response rate was 51%.

The aims of the study and instructions for answering the questionnaire were explained to the participants at the beginning of the questionnaire. Participation was voluntary. Since teacher educators may apply different approaches to teaching and ways to integrate research into teaching according to different teaching contexts (Neumann, 1992, 1994; Prosser & Trigwell, 2006), in the instructions of the questionnaire, respondents were asked to think of a specific course or teaching situation while filling in the questionnaire. Furthermore, they were asked to give descriptions about the course, such as the names, teaching content and methods used and the study level of the students.

4.4 Analyses

Study I was an investigation of how Finnish teacher educators integrated research into teaching, and how the research-teaching integration and their reported research-teaching closeness and role of teachers and/or researchers correlated with their reported approaches to teaching. Both quantitative and qualitative research methods were applied. The participants' mean scores concerning their research-teaching closeness and teacher/researcher role were calculated first to provide a general picture. Then, their descriptions of research-teaching integration were analysed with the qualitative content analysis applying an abductive strategy (Timmermans & Tavory, 2012).

Research-teaching integration was defined as the variety of ways teacher educators integrated the components of research into the components of teaching in their teaching. The analysis started with five categories of research-teaching integration drawn from previous studies (Cochran-Smith, 2005; Krokfors et al., 2011; Visser-Wijnveen et al., 2010). One more category was revealed after the data were analysed. The operational definitions of the six categories are shown in Table 4.4. A total of 86 descriptions were split into 159 analysis units and each analysis unit contains one or several sentences with one central meaning (Graneheim & Lundman, 2004; Stemler, 2001). The analyses went through the process of defining the categories, coding, revising the categories, and creating sub-categories. The data analysis process and report of research findings followed the work of Elo et al. (2014), and Graneheim and Lundman (2004) to increase the trustworthiness of this study.

Table 4.4. Category and operational definition of the category.

Category	Operational definition
1. Teaching content is based on research	Teacher educators use their own or others' research as their teaching content to transfer academic knowledge to student teachers and develop student teachers' independent thinking (Visser-Wijnveen et al., 2010).
2. Teaching methods and course design are based on research	Teacher educators benefit from their research in teacher education and develop their teaching methods accordingly (Cochran-Smith, 2005; Krokfors et al., 2011).
3. Applying inquiry-oriented methods in teaching	Teacher educators organise the course based on inquiry-oriented activities to guide student teachers to learn in an analytical and inquiring way to develop their pedagogical thinking (Krokfors et al., 2011).
4. Acting as researchers in teacher education	Teacher educators work as researchers and conduct research on what and how they teach, and on topics in teacher education (Cochran-Smith, 2005).
5. Encouraging student teachers' involvement in research work	Teacher educators involve student teachers in the research process to provide them with the experience of conducting research (Visser-Wijnveen et al., 2010).
6. A supportive relationship between research and teaching	Teacher educators consider the research-teaching nexus is complementary and fairly evident. Teaching and research support each other in a general and broad sense.

Note: Categories 1-5 were drawn from previous studies, category 6 was developed by the author of this thesis.

In the first step, the doctoral candidate and the supervisors together defined the first five categories according to previous studies. The doctoral candidate read through all the descriptions repeatedly to obtain a sense of the whole and divided the texts into analysis units. The differences and similarities of the analysis units were compared. Most of the analysis units were classified into the five categories. However, some unclear descriptions needing further analysis were revealed. All the researchers worked together on the unclear descriptions and placed some of them into the five categories. In the second step, all the researchers worked on the remaining descriptions that did not fit into any of the five categories, and one more category was created. The doctoral candidate went through all the descriptions again to make sure no more categories could be found (Hickey & Kipping, 1996; Stemler, 2001). In the third step, according to the different aspects the participants stressed, the doctoral candidate analysed the main categories further, sub-categories within some of the main categories were formed. The supervisors then went through all the answers again and agreed with the doctoral candidate about the main and sub-categories, and that no more categories could be identified. The analysis process insured that no analysis units fall between two categories. The categories and sub-categories were discussed in-depth, quotations were chosen to give examples and illustrate the main point of the category (Elo et al., 2014; Taylor-Powell & Renner, 2003).

In the next phase, Finnish teacher educators' reported approaches to teaching were explored. The function of the ATI-R (Trigwell et al., 2005) in the present study context was obtained by exploratory factor analysis (EFA) with principal axis factoring and Promax rotation. Two scales, the student-focused and teacher-focused approaches to teaching, were revealed. The participants' mean scores on these two scales were calculated. Next, they were grouped into three clusters by a two-step cluster analysis. Their different scores on the student-focused and teacher-focused approaches to teaching scales indicated their preference towards the two approaches. The three clusters were compared concerning their reported research-teaching closeness and teacher/researcher role by using one-way analysis of variance (one-way ANOVA). In the final step, the main categories of research-teaching integration were coded into dummy variables, how research-teaching integration was associated with approaches to teaching were analysed with Chi-square tests.

In *Studies II* and *III*, the data collected from teacher educators in China were analysed. Quantitative research procedures were applied in *Study II*. Firstly, the exploratory factor analysis (EFA) with principal axis factoring and Promax rotation and reliability analysis revealed a 2-factor structure of the ATI-R (Trigwell et al., 2005), i.e., the student-focused and teacher-focused approaches to teaching scales. However, some items on the student-focused and teacher-focused approaches to teaching varied and were different from the ones in the Finnish context. Secondly, the participants were classified into three groups in a two-step cluster analysis according to their scores on the two scales of approaches to teaching. Finally, one-way ANOVA was applied to compare the three clusters concerning their reported closeness between research and teaching and their roles as teachers and/or researchers.

Study III was a quantitative analysis of the relationship between the participants' reported approaches to teaching and their self-efficacy beliefs in teaching, and experiences of burnout. Based on the three groups of teacher educators revealed in *Study II*, one-way ANOVA was conducted to investigate the differences in their reported self-efficacy beliefs in teaching and experiences of burnout and stress to explain how the participants with different approaches to teaching differed on these variables. Afterwards, to further understand how self-efficacy beliefs in teaching, and burnout and stress predict the student-focused and teacher-focused approaches to teaching, multiple regression analyses were applied. Furthermore, the relationship between these variables (the student-focused and teacher-focused approaches to teaching, self-efficacy beliefs in teaching, and burnout and stress) was analysed to explain supplementarily how they were related to each other through a correlation analysis.

4.5 Summary of the methods

The aim of this dissertation was to explore teacher educators' reported research-teaching closeness and teacher/researcher role, their research-teaching integration, and how these were related to their reported approaches to teaching, furthermore, how their choices of approaches to teaching were associated with the different levels of self-efficacy beliefs in teaching and experiences of burnout. The phenomena were investigated in the teacher education contexts of Finland and China. To achieve the research aims, a mixed-methods research approach was applied to provide answers to the research questions in the best possible manner. The data were collected with a survey questionnaire. Furthermore, they were analysed with quantitative methods, such as exploratory factor analyses and one-way ANOVA, and qualitative content analysis. The research aims and questions, participants, instrument and data analysis methods used in the three sub-studies are summarised in Table 4.5.

Table 4.5. Summary of the methods.

Study	Research aim	Research questions	Participants	Instrument	Data analysis methods
Study I	To explore teacher educators' reported research-teaching closeness and teacher/research role, their practice to integrate research and teaching, and how these are related to their reported approaches to teaching	Research questions 1, 2, 3, 4 and 5	101 teacher educators from Finland	Questionnaire (Likert-scale items and one open-ended question)	Qualitative content analysis Exploratory factor analysis Two-step cluster analysis One-way ANOVA Chi-square test
Study II	To explore teacher educators' reported approaches to teaching, and the relationship between the approaches to teaching and their reported research-teaching closeness and teacher/researcher role	Research questions 1, 3 and 4	115 teacher educators from China	Questionnaire (Likert-scale items)	Exploratory factor analysis Two-step cluster analysis One-way ANOVA
Study III	To explore the relationship between teacher educators' reported approaches to teaching and self-efficacy beliefs in teaching and experiences of burnout	Research questions 6 and 7	115 teacher educators from China	Questionnaire (Likert-scale items)	One-way ANOVA Multiple regression analysis Correlation analysis

5 Results

5.1 Teacher educators' research-teaching integration

Teacher educators' reported research-teaching closeness and teacher/researcher role (Studies I and II)

Before exploring teacher educators' ways of integrating research and teaching, how they thought about the general relationship between research and teaching, and how much they perceived themselves as teachers and/or researchers were investigated first.

The participants self-estimated how close their research was related to their teaching and chose one answer from the given choices. In *Study I*, almost 80% of the Finnish teacher educators considered research and teaching as either "highly related" or "totally related". In other words, most of them believed that the relationship between their research and teaching were intensively close. Only five per cent of them thought that their research and teaching had a loose relationship, or there was no link between them. In *Study II*, about half of the Chinese teacher educators reported that their research and teaching were highly related or totally related. One third mentioned that their research and teaching were partly related. A minority thought that the research and teaching were loosely related or that there was no link between them (Table 5.1-1).

Table 5.1-1. Frequency of Finnish and Chinese teacher educators on their reported research-teaching closeness.

Research-teaching closeness	Finland		China	
	f	Percentage (%)	f	Percentage (%)
"No link between them"	1	1.0	4	3.5
"Loosely related"	4	4.0	14	12.2
"Partly related"	15	14.9	38	33.0
"Highly related"	51	50.5	48	41.7
"Totally related"	27	26.7	11	9.6
Missing answer	3	2.9	0	0
Total	101	100	115	100

Considering their teacher/researcher role, almost half of the Finnish teacher educators considered themselves more as teachers than researchers. The teacher role was stressed more often than the researcher role. Similar among Chinese teacher educators, it was revealed that the teacher role was stressed more often than the

researcher role by the participants, almost half of them considered themselves mainly as teachers in their professional field (Table 5.1-2).

Table 5.1-2. Frequency of Finnish and Chinese teacher educators on their reported teacher/researcher role.

Teacher/researcher role	Finland		China	
	f	Percentage (%)	f	Percentage (%)
More researchers than teachers	20	19.8	30	26.0
More teachers than researchers	49	48.5	54	46.9
As much researchers as teachers	32	31.7	29	25.2
Missing answer	0	0	2	1.9
Total	101	100	115	100

Finnish teacher educators' research-teaching integration (Study I)

Finnish teacher educators' descriptions of their research-teaching integration were analysed, and six ways were found (Table 5.1-3).

Table 5.1-3. Main and sub-category of the research-teaching integration.

Main category (frequency)	Sub-category (frequency)
1. Teaching content is based on research (59)	1.1 General information of research in a certain field is introduced in teaching (21)
	1.2 Teaching content is based on one's own research (37)
	1.3 Teaching content is based on other's research (7)
	1.4 Research papers are used in teaching (9)
2. Teaching methods and course design are based on research (8)	
3. Applying inquiry-oriented methods in teaching (7)	
4. Acting as researchers in teacher education (30)	4.1 Doing research on one's own teaching practice (9)
	4.2 Doing research on one's teaching content (11)
	4.3 Doing research on teacher education (13)
5. Encouraging student teachers' involvement in research work (17)	5.1 Supporting and supervising student teachers' theses writing (12)
	5.2 Encouraging student teachers' involvement in research process (6)
6. A supportive relationship between research and teaching (6)	

(1) Teaching content is based on research.

Teacher educators based their teaching content on research. This was the most often mentioned form of research-teaching integration. The general aim was to transfer academic knowledge to student teachers. Because of teacher educators' experience as researchers, they were able to select the most suitable content to integrate with the course.

Teacher educators held different intentions when integrating research with teaching content. Some teacher educators introduced the general information of research to students, intending to set a general knowledge base of the certain research field for them. Meanwhile, many teacher educators mentioned the use of specific research projects as examples in the course. Some of them shared the details of their own research, such as the processes, results and unsolved issues with students, and aimed to help student teachers to learn how to conduct research. They encouraged the students to develop interests in the topics they work on and inspired the students to think about the challenges that need to be solved. Some teacher educators used other researchers' research, which was closely related to their own study topics but had different focuses. The integration broadened the scope of the teaching content and provided different insights for the teachers and students. Finally, the use of research papers in teaching was emphasised, as reading materials during class or supplementary materials for assignments after class. These teacher educators aimed to help student teachers to develop their critical and independent thinking and familiarise students with academic writing.

(2) Teaching methods and course design are based on research.

Teacher educators' teaching methods of a course and course design were based on research. Some of them conducted research on teaching methods, thus, they developed their teaching methods and pedagogy according to the research results. Others mentioned that their involvement in research gave them the chance to access the recent knowledge on how something can be taught, thus, they adapted their teaching accordingly.

(3) Applying inquiry-oriented methods in teaching.

Teacher educators reported designing their teaching in an inquiry-based way, meaning that inquiry-based thinking was embedded in the whole teaching process. The teaching normally started with previous studies, then teacher educators guided the students to test the theory of others or work on the students' own study. Teacher educators were guiders and gave feedback to students, who actively participated in the learning activities. In the process, the theoretical research results were related to practical actions, and the teaching was analytical and systematic. The aim was to develop both teachers' and students' critical thinking, improve students' independent thinking and encourage the students to be inquiry-oriented towards their work.

(4) Acting as researchers in teacher education.

Teacher educators described their experience as researchers in teacher education. For these teacher educators, the research-teaching integration happened in a way that their research got resources and inspiration from their teaching work. Their research mainly focused on three domains, their own teaching practice, the content they were teaching, and the topics in teacher education that were related to their present teaching work.

Some of them studied how they teach. This aspect was related to the above-mentioned form of research-teaching integration that teacher educators developed their teaching methods based on their research results. They were practitioner-researchers and worked alone or with their colleagues. They made well-organised plans before teaching and developed them into action research, meanwhile, paid attention to how their students approached learning during the course. Meanwhile, some teacher educators' research focused on topics related to their teaching content, i.e., what they teach. Furthermore, some participants mentioned that they researched broad themes in teacher education and teaching in general. These research topics were related to their present teaching, thus through questionnaires and observations, they acquired research data from their students. The courses and teaching were a research site for them to obtain research inspiration and first-hand data.

(5) Encouraging student teachers' involvement in research work.

Some teacher educators in the study described their research-teaching integration with their students' participation. Two ways were mentioned. Some teachers talked about supervising their students to write theses or course assignments. They acted as tutors and their experience in academic writing helped them to guide the students to do the same thing. These teachers familiarised their students with how to report research results. They expected the students to develop research interests in the topics they currently working on. They mentioned that, in this way, they also deepened their own understanding of the research subject.

While providing students with a more complete and deeper experience of research, other teacher educators directly involved their students in the research process. They helped the students to improve their research competence and introduced them further to the discipline. Teacher educators were researchers and role models for student teachers. Furthermore, they considered the students as researchers and colleagues engaged in the research community.

(6) A supportive relationship between research and teaching.

The above-mentioned five forms of research-teaching integration were interpreted from teacher educators' descriptions of tangible examples. Some participants did not give any examples but illustrated a supportive and fairly evident research-teaching nexus at a more general level. For some teacher educators, their research

benefited from their teaching work. Teaching broadened their minds on general topics, developed their critical thinking, and provided ideas and inspiration for their research. Others mentioned that research supported their teaching. By being involved in research activities, they got the chance to obtain new viewpoints and educational theory, thus they reflected on and improved their teaching constantly. In this way, they kept up with the changing requirements of students and society.

In most cases, one teacher educator reported more than one way to integrate research with teaching. The different forms of research-teaching integration were interrelated with each other and revealed differences in teacher educators' perceptions, such as how they perceived research, teaching and learning, and how they viewed their own and their students' roles in the research-teaching integration. A summary of the six forms of research-teaching integration is in Table 5.1-4.

Table 5.1-4. Six forms of research-teaching integration.

Research-teaching integration	Aspect of teaching integrated with research	Level of the integration	Orientation of the integration	Integration happens mainly among	Role of teacher educators	Students' learning	Presented with specific examples
1. teaching content is based on research	what teacher educators teach	specific	research to teaching; research influences teaching content	teacher educators	teacher	learn about research knowledge	yes
2. teaching methods and course design are based on research	how teacher educators teach	specific	research to teaching; research influences teaching methods	teacher educators	teacher	learn in a research-based way	yes
3. Applying inquiry-oriented methods in teaching	how teacher educators teach	diffuse	research to teaching; research influences teaching methods	teacher educators	teacher	learn in a research-based way	yes
4. Acting as researchers in teacher education	what and how teacher educators teach	specific	teaching to research; teaching influences research topics	teacher educators	researcher	learn in a research-informed environment	yes
5. Encouraging student teachers' involvement in research work	how teacher educators teach	specific	research to teaching; research influences teaching methods	teacher educators and student teachers	researcher	learn as researchers	yes
6. A supportive relationship between research and teaching	–	–	mutually supportive	–	both roles important	–	no

5.2 Teacher educators' reported approaches to teaching

Finnish teacher educators' reported approaches to teaching (Study I)

To detect how the ATI-R (Trigwell et al., 2005) functioned in the Finnish teacher education context, exploratory factor analyses with principal axis factoring and Promax rotation were applied to analyse the factor structure of the inventory. The scree test (Cattell, 1966) showed that the plot of eigenvalues revealed two factors retained with the cumulative variance extracted of 37.09% (Cattell, 1966). Furthermore, exploratory factor analyses with three and four factors were also conducted and the item loading tables of these analyses were compared. The two-factor solution was finally adopted because it revealed the cleanest factor structure (Costello & Osborne, 2005). The two factors were the CCSF scale with nine items and the ITTF scale with eight items. Other items were deleted because of their low communalities and the reliability of the scale increased after the deletion (Table 5.2-1). The cut off for loading of .32 to determine whether an item contributes towards the factor was referenced (Tabachnick & Fidell, 2001). The factor loadings of the items on the respective scale were between .39 and .83.

Table 5.2-1. CCSF and ITTF scales of the ATI-R (Trigwell et al., 2005) in the Finnish teacher education context.

Items	Communalities	Loadings	
		CCSF	ITTF
CCSF (9 items; Cronbach's α: .84)			
3. In this course I try to develop a conversation with my students about the topics we are studying.	.70	.76	-.02
6. I set aside some teaching time so that the students can discuss, among themselves, key concepts and ideas in this subject.	.66	.76	.02
8. I encourage students to restructure their existing knowledge in terms of the new way of thinking about the subject that they will develop.	.54	.54	.02
10. In teaching sessions for this subject, I deliberately provoke debate and discussion.	.62	.71	.06
17. I make available opportunities for students in this course to discuss their changing understanding of the subject.	.68	.83	.07
18. It is better for students in this course to generate their own notes rather than copy mine.	.46	.58	.02
23. I see teaching as helping students develop new ways of thinking in this subject.	.48	.51	.03
27. Teaching in this course should help students question their own understanding of the subject matter.	.35	.43	-.11
28. Teaching in this course should support students in finding their own learning resources.	.43	.46	-.12
ITTF (8 items; Cronbach's α: .77)			
1. In this course students should focus their studies on what I provide them.	.48	-.02	.62
4. It is important to present a lot of facts to students so that they know what they have to learn for this subject.	.41	.04	.44
11. I structure my teaching in this subject to help students to pass the assessment of the course.	.45	.11	.45
13. I think it is important to give students a good set of notes in this course.	.47	-.02	.64
14. In this course, I provide the students with the information they will need to pass the formal assessments.	.53	.01	.65
15. I should know the answers to any questions that students may put to me during this course.	.42	-.29	.42
21. In this course my teaching focuses on the good presentation of information to students.	.50	-.30	.39
25. My teaching in this course focuses on delivering what I know to the students.	.50	-.10	.64
5 deleted items			
2. It is important that the course is completely described in terms of specific objectives that relate to the assessment of the course.	.41	.43	.34
7. In this course I concentrate on covering the information that might be available from key texts and readings.	.19	-.06	.25
20. A lot of teaching time in this course should be used to question students' ideas.	.31	30	-.12
24. In teaching this subject it is important for me to monitor students' understanding of the subject matter.	.26	.24	.23
29. I present material to enable students to build up an information base in this subject.	.40	.19	.34

Finnish teacher educators had high scores on the CCSF scale (M = 4.40, SD = .54), and lower scores on the ITTF scale (M = 2.9, SD = .66). One previous study has identified the existence of student-focused and teacher-focused approaches to teaching, as well as dissonant approaches to teaching in the Finnish context (Postareff et al., 2008). *Study I* applied a two-step cluster analysis to classify Finnish teacher educators based on the approaches to teaching they reported adopting. The analysis revealed three clusters with the lowest BIC coefficient of 117.40 and the largest ratio of distance measures of 2.41 (Table 5.2-2 and Figure 4).

Table 5.2-2. Means and standard deviations of the three Finnish teacher educator clusters on the CCSF and ITTF scales.

Cluster	CCSF		ITTF	
	M	SD	M	SD
Cluster $1_{Finland}$ (n = 38)	4.68	.23	2.27	.37
Cluster $2_{Finland}$ (n = 32)	4.73	.23	3.42	.37
Cluster $3_{Finland}$ (n = 31)	3.73	.42	3.14	.53

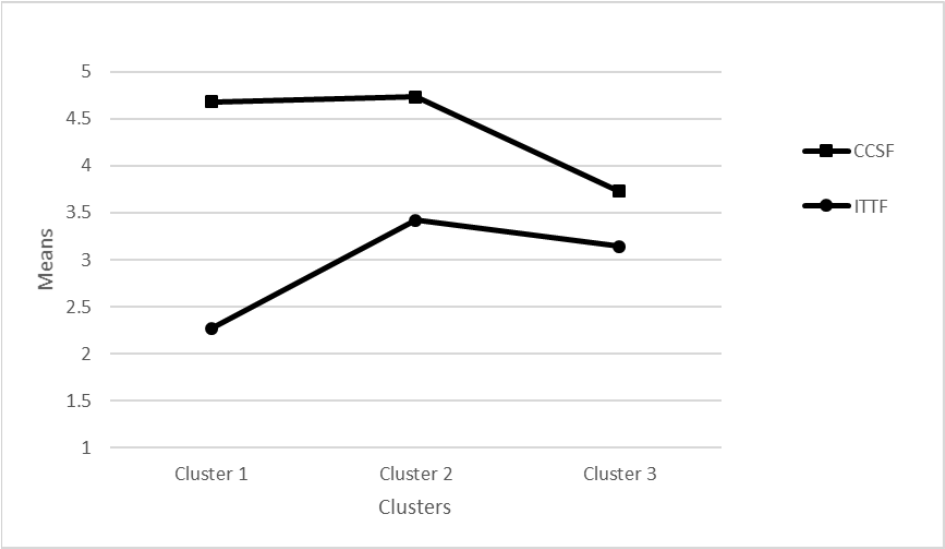


Figure 4. Means of the three Finnish teacher educator clusters on the CCSF and ITTF scales.

The three clusters were compared to see how they differed from each other at a statistically significant level (Table 5.2-3). It was shown that on the CCSF scale, Cluster $1_{Finland}$ and Cluster $2_{Finland}$ had almost the same scores, Cluster $3_{Finland}$ scored the lowest among the three clusters. On the ITTF scale, Cluster $2_{Finland}$ had the highest scores, Cluster $3_{Finland}$ scored higher than Cluster $1_{Finland}$, which meant that Cluster $1_{Finland}$ had the lowest scores.

The comparisons between the three clusters revealed that these Finnish teacher educators differed concerning their reported approaches to teaching. Cluster $1_{Finland}$ was "*Teacher educators with a student-focused approach to teaching*". Compared to Cluster $2_{Finland}$, Cluster $1_{Finland}$ applied a consonant approach to teaching in a CCSF way. Cluster $2_{Finland}$ was "*Teacher educators with a dissonant approach to teaching*". Though these teacher educators showed a favour of the CCSF approach, dissonance was revealed because they scored highly on both the CCSF and ITTF approaches to teaching. This could mean that in actual teaching situations, these teacher educators aimed to help students to reconstruct their knowledge and stressed the students' own learning activities. They also focused on themselves and what they do as teachers. Cluster $3_{Finland}$ was "*Teacher educators with a vague approach to teaching*". Compared to the other two clusters, they had very close scores on the CCSF and ITTF approaches to teaching and did not show a preference towards either of the two approaches. Both consonance and dissonance were revealed in Finnish teacher educators' reported approaches to teaching.

Table 5.2-3. Comparisons between the three clusters of Finnish teacher educators.

	CCSF		**ITTF**	
	t	***p***	**t**	***p***
Cluster $1_{Finland}$ – Cluster $2_{Finland}$	-1.00	.319	-13.00	< .001
Cluster $1_{Finland}$ – Cluster $3_{Finland}$	11.83	< .001	-8.06	< .001
Cluster $2_{Finland}$ – Cluster $3_{Finland}$	11.76	< .001	2.45	.017

Note: Cluster $1_{Finland}$ = teacher educators with a student-focused approach to teaching, Cluster $2_{Finland}$ = teacher educators with a dissonant approach to teaching, Cluster $3_{Finland}$ = teacher educators with a vague approach to teaching.

Chinese teacher educators' reported approaches to teaching (Study II)

The same data analysis procedures were applied on the Chinese teacher educators as with their Finnish counterparts. Exploratory factor analysis (principal axis factoring with Promax rotation) and reliability analysis were applied to check the trustworthiness of the inventory (ATI-R; Trigwell et al., 2005) in the research context. The scree test revealed two factors with the cumulative variance extracted of 36.63%. The analysis showed that the factor structure of the inventory slightly varied. Four items (items 4, 15, 21 and 29) on the ITTF scale were loaded to the CCSF scale. One item (item 20) was loaded from the CCSF scale to the ITTF scale. Two items were left out because of their low communalities and the reliability of the scale increased after the delete of the items. In the end, the two scales were the CCSF scale with 13 items and the ITTF scale with seven items (Table 5.2-4). The cut off for loading of .32 was referenced (Tabachnick & Fidell, 2001).

The three items (items 4, 21 and 29) loaded from the ITTF scale to the CCSF scale were about teachers' presentation of information to students. This meant that, firstly, the CCSF scale was more sophisticated, and it could include elements from the ITTF approach (Trigwell et al., 2005). Furthermore, in the Chinese teacher education context, the conceptions of student-focused and teacher-focused approaches to teaching differed from the ones in the traditional Western contexts. Chinese teacher educators believed that presenting information to students was included in the student-focused approach to teaching, rather than the teacher-focused approach.

Table 5.2-4. CCSF and ITTF scales of the ATI-R (Trigwell et al., 2005) in the Chinese teacher education context.

Items	Communalities	Loadings	
		CCSF	ITTF
CCSF (13 items; Cronbach's α: .86)			
3. In this course I try to develop a conversation with my students about the topics we are studying.	.50	.57	-.18
6. I set aside some teaching time so that the students can discuss, among themselves, key concepts and ideas in this subject.	.67	.65	-.02
8. I encourage students to restructure their existing knowledge in terms of the new way of thinking about the subject that they will develop.	.47	.65	-.08
10. In teaching sessions for this subject, I deliberately provoke debate and discussion.	.61	.64	-.13
17. I make available opportunities for students in this course to discuss their changing understanding of the subject.	.59	.67	.15
18. It is better for students in this course to generate their own notes rather than copy mine.	.38	.50	.01
23. I see teaching as helping students develop new ways of thinking in this subject.	.53	.58	-.01
24. In teaching this subject it is important for me to monitor students' understanding of the subject matter.	.37	.53	.11
27. Teaching in this course should help students question their own understanding of the subject matter.	.39	.47	.15
28. Teaching in this course should support students in finding their own learning resources.	.53	.49	-.08
(The three items which were originally on the ITTF scale)			
4. It is important to present a lot of facts to students so that they know what they have to learn for this subject.	.34	.51	.09
21. In this course my teaching focuses on the good presentation of information to students.	.49	.51	.15
29. I present material to enable students to build up an information base in this subject.	.57	.56	-.14
ITTF (7 items; Cronbach's α: .72)			
1. In this course students should focus their studies on what I provide them.	.38	.24	.44
2. It is important that the course is completely described in terms of specific objectives that relate to the assessment of the course.	.44	-.07	.63
7. In this course I concentrate on covering the information that might be available from key texts and readings.	.36	.04	.52
11. I structure my teaching in this subject to help students to pass the assessment of the course.	.41	-.10	.54
13. I think it is important to give students a good set of notes in this course.	.41	-.15	.59
14. In this course, I provide the students with the information they will need to pass the formal assessments.	.34	-.06	.49
25. My teaching in this course focuses on delivering what I know to the students.	.36	.24	.50
2 deleted items			
15. I should know the answers to any questions that students may put to me during this course.	.38	.30	.09
20. A lot of teaching time in this course should be used to question students' ideas.	.26	.22	.30

In the next step, Chinese teacher educators' mean scores on the CCSF scale (M = 3.87; SD = .67) and ITTF scale (M = 2.52; SD = .69) were calculated. In line with *Study I*, a two-step cluster analysis was applied to group Chinese teacher educators to see what kinds of approaches to teaching they reported. Three clusters were revealed with the lowest BIC coefficient of 136.49 and the largest ratio of distance measures of 2.15 (Table 5.2-5 and Figure 5).

Table 5.2-5. Means and standard deviations of the three Chinese teacher educator clusters on the CCSF and ITTF scales.

Cluster	CCSF		ITTF	
	M	SD	M	SD
Cluster 1_{China} (n=53)	4.17	.38	2.03	.44
Cluster 2_{China} (n=37)	4.08	.45	3.26	.36
Cluster 3_{China} (n=25)	2.90	.49	2.44	.49

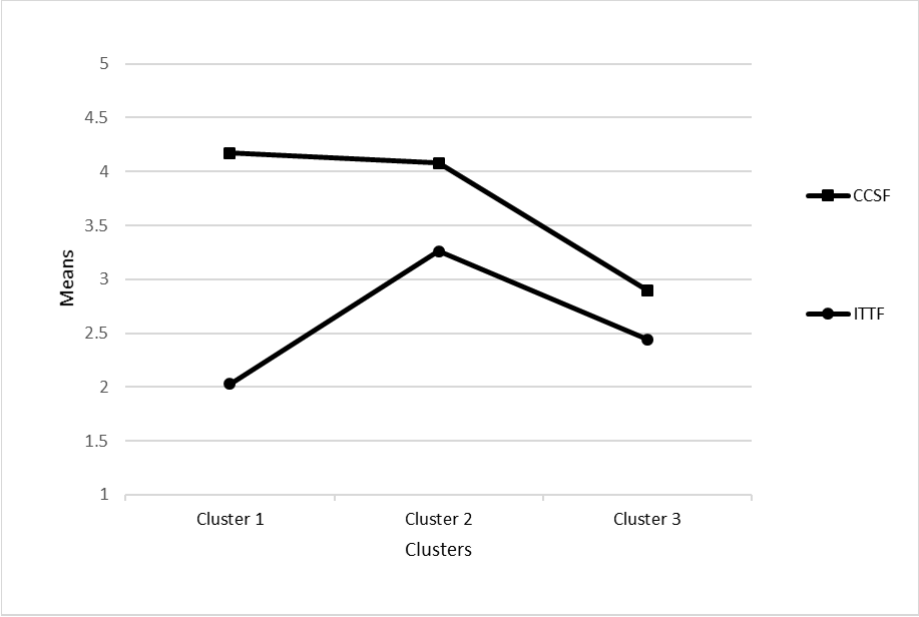


Figure 5. Means of the three Chinese teacher educator clusters on the CCSF and ITTF scales.

Differences between the three clusters concerning their approaches to teaching were revealed (Table 5.2-6). On the CCSF scale, Cluster 1_{China} and 2_{China} had almost the same scores, Cluster 3_{China} scored the lowest. Meanwhile, on the ITTF scale, Cluster 2_{China} scored the highest, Cluster 3_{China} had the middle score while Cluster 1_{China} scored the lowest.

Study II revealed approaches to teaching among Chinese teacher educators that were similar to the ones among their colleagues in Finland. Thus, the three clusters of Chinese teacher educators were named in line with *Study I*. Cluster 1_{China} was

"*Teacher educators with a student-focused approach to teaching*". They showed consistency in their approaches to teaching to be CCSF with the highest score on the CCSF scale and the lowest score on the ITTF scale. Cluster 2_{China} was "*Teacher educators with a dissonant approach to teaching*" because though they stressed the CCSF approach more over the ITTF approach, they scored highly on both scales meaning that the ITTF approach was also an important component in their teaching. Cluster 3_{China} was "*Teacher educators with a vague approach to teaching*" since they had similar scores on both the CCSF and ITTF scales and did not show any preferences. A cluster of teacher educators with a strong teacher-focused approach to teaching did not emerge in the analysis.

Table 5.2-6. Comparisons between the three clusters of Chinese teacher educators.

	CCSF		**ITTF**	
	t	***p***	**t**	***p***
Cluster 1_{China} – Cluster 2_{China}	1.04	.300	-14.00	< .001
Cluster 1_{China} – Cluster 3_{China}	12.50	< .001	-3.64	< .001
Cluster 2_{China} – Cluster 3_{China}	9.70	< .001	7.19	< .001

Note: Cluster 1_{China} = teacher educators with a student-focused approach to teaching, Cluster 2_{China} = teacher educators with a dissonant approach to teaching, Cluster 3_{China} = teacher educators with a vague approach to teaching.

5.3 Teacher educators' research-teaching integration and their reported approaches to teaching

The relationship between teacher educators' reported research-teaching closeness, teacher/researcher role, and approaches to teaching (Studies I and II)

In *Study I*, whether Finnish teacher educators with different approaches to teaching vary in their reported research-teaching closeness and teacher/researcher role was explored. One-way ANOVA was applied to compare the three clusters, but no difference was revealed concerning the closeness between their research and teaching ($F(2, 98) = 1.23$, $p = .297$). No difference was shown in how they considered their roles as teachers and/or researchers ($F(2, 98) = 1.42$, $p = .246$).

Following the logic of analysis in *Study I*, firstly, *Study II* compared the three clusters of Chinese teacher educators through one-way ANOVA on their research-teaching closeness ($F(2, 112) = 3.10$, $p = .049$). Bonferroni's post hoc test (*p-value* adjusted) revealed that Cluster 1_{China} had a statistically significantly higher score than Cluster 3_{China} (Table 5.3-1). The partial η^2 was .05, which was seen as a small effect in practical significance (Tabachnick & Fidell, 2001). Compared with the teacher educators with a vague approach to teaching, the teacher educators applying a consonant approach to teaching perceived a closer relationship

between their research and teaching (Table 5.3-2). Considering this difference between Cluster 1_{China} and Cluster 3_{China} on the CCSF scale, it meant that the teacher educators with a student-focused approach to teaching emphasised a closer relationship between their research and teaching than the teacher educators with a less student-focused approach to teaching. The analysis did not find any relationship between the research-teaching closeness and the teacher-focused approach to teaching.

Table 5.3-1. Bonferroni's post hoc test on Chinese teacher educators' reported research-teaching closeness.

	Mean difference	p_{adj}
Cluster 1_{China} – Cluster 2_{China}	.25	.653
Cluster 1_{China} – Cluster 3_{China}	.56	.047
Cluster 2_{China} – Cluster 3_{China}	.32	.608

Note: Cluster 1_{China} = teacher educators with a student-focused approach to teaching, Cluster 2_{China} = teacher educators with a dissonant approach to teaching, Cluster 3_{China} = teacher educators with a vague approach to teaching; P_{adj} = Bonferroni adjusted *p-value*.

Table 5.3-2. Means and standard deviations of the three Chinese teacher educator clusters on their research-teaching closeness.

Cluster	**M**	**SD**
Cluster 1_{China}	3.61	.93
Cluster 2_{China}	3.36	.76
Cluster 3_{China}	3.04	1.15

Note: Cluster 1_{China} = teacher educators with a student-focused approach to teaching, Cluster 2_{China} = teacher educators with a dissonant approach to teaching, Cluster 3_{China} = teacher educators with a vague approach to teaching.

Afterwards, comparisons were conducted between the three Chinese teacher educator clusters to see how they differed from each other concerning the extent to which they considered themselves teachers and/or researchers by using one-way ANOVA. However, no difference was found ($F(2, 112) = .03$, $p = .966$).

The relationship between Finnish teacher educators' research-teaching integration and reported approaches to teaching (Study I)

One of the main aims of *Study I* was to explore how the teacher educators with different approaches to teaching varied in the ways in which they integrated research and teaching. The percentage of the main categories of Finnish teacher educators' research-teaching integration were calculated per cluster (Table 5.3-3).

Table 5.3-3. Percentage (frequency/participants) of the main category per cluster.

Category	Percentage (%)		
	Cluster $1_{Finland}$	**Cluster $2_{Finland}$**	**Cluster $3_{Finland}$**
	(n = 35)	**(n = 27)**	**(n = 24)**
1. Teaching content is based on research	71.4	70.4	62.5
2. Teaching methods and course design are based on research	14.3	3.7	8.3
3. Applying inquiry-oriented methods in teaching	17.1	0	4.2
4. Acting as researchers in teacher education	31.4	29.6	45.8
5. Encouraging student teachers' involvement in research work	14.3	22.2	25
6. A supportive relationship between research and teaching	5.7	11.1	4.2

Note: Cluster $1_{Finland}$ = teacher educators with a student-focused approach to teaching, Cluster $2_{Finland}$ = teacher educators with a dissonant approach to teaching, Cluster $3_{Finland}$ = teacher educators with a vague approach to teaching.

With the percentage showed in Table 5.3-3, it was observed that the Finnish teacher educators varied in the ways to integrate research with teaching when they applied different approaches to teaching. More than 50% of the teacher educators in each cluster mentioned the integration of research with teaching content. At the same time, the teacher educators with a student-focused approach to teaching (Cluster $1_{Finland}$) and the ones with a dissonant approach to teaching (Cluster $2_{Finland}$) reported this form of research-teaching integration more often than the teacher educators with a vague approach to teaching (Cluster $3_{Finland}$). The situation varied in other forms of research-teaching integration. For example, Cluster $1_{Finland}$ and Cluster $3_{Finland}$ reported the integration of research with teaching methods more often than Cluster $2_{Finland}$. Meanwhile, Cluster $1_{Finland}$ talked more often about applying inquiry-oriented methods in teaching than Cluster $3_{Finland}$, while no reports came from Cluster $2_{Finland}$. Another often mentioned aspect was acting as researchers in teacher education, and it was shown that Cluster $3_{Finland}$ reported this more often than Cluster $1_{Finland}$ and Cluster $2_{Finland}$. While Cluster $2_{Finland}$ and Cluster $3_{Finland}$ mentioned more often encouraging students' involvement in research than Cluster $1_{Finland}$. Further comparisons were conducted in Chi-square tests. However, the differences between the clusters concerning how they integrate research and teaching were not significant at the statistical level.

5.4 Teacher educators' reported approaches to teaching, self-efficacy beliefs in teaching and burnout

The relationship between Chinese teacher educators' reported approaches to teaching, self-efficacy beliefs in teaching and experiences of burnout (Study III)

Exploratory factor analyses and Cronbach's alphas were calculated on the self-efficacy beliefs in teaching and burnout scales to detect the trustworthiness of the items. On the self-efficacy scale, one factor was extracted and the Cronbach's alpha of this scale was .85. On the burnout scale, two factors were extracted, inadequacy in teacher-student interaction, and exhaustion and stress, and the Cronbach's alphas of the two sub-scales were .72 and .69, respectively.

The means and standard deviations of Chinese teacher educators on their reported self-efficacy beliefs in teaching, and experiences of burnout and stress were calculated (Table 5.4-1). Two items on the exhaustion sub-scale were measured with a seven-point Likert scale while the single stress item was measured using a ten-point Likert scale, the mean and standard deviation on this single item were calculated separately.

Table 5.4-1. Means and standard deviations of Chinese teacher educators on the self-efficacy beliefs in teaching and burnout scales.

	Self-efficacy beliefs in teaching	**Burnout and stress**		
		Inadequacy in teacher-student interaction	**Exhaustion**	**Stress**
	(5-point Likert scale)	**(5-point Likert scale)**	**(7-point Likert scale)**	**(10-point Likert scale)**
M	4.28	1.82	3.05	5.01
SD	.70	.89	1.61	2.82

Correlation analysis showed statistically significant and positive relationships between the student-focused approach to teaching and self-efficacy beliefs in teaching, and between the teacher-focused approach to teaching and inadequacy in teacher-student interaction. The analysis also revealed a statistically significant and negative relationship between the student-focused approach to teaching and exhaustion. No relationship was found between approaches to teaching and the single item of stress (Table 5.4-2).

Table 5.4-2. Correlations of approaches to teaching, self-efficacy beliefs in teaching and burnout.

		Approaches to teaching		Self-efficacy	Burnout and stress		
		CCSF	ITTF		Inadequacy	Exhaustion	Stress
		R	R	R	R	R	R
Approaches to teaching	CCSF	—	-.08	.49**	-.08	-.30**	-.13
	ITTF	-.08	—	-.03	.33**	.11	.03
Self-efficacy		.49**	-.03	—	-.43**	-.22*	.00
Burnout and stress	Inadequacy	-.08	.33**	-.43**	—	.28**	.12
	Exhaustion	-.30**	.11	-.22*	.28**	—	.52**
	Stress	-.13	.03	.00	.12	.52**	—

Note: ** means the correlation is significant at the 0.01 level, * means the correlation is significant at the 0.05 level.

The multiple regression analysis showed that 41.7% of the total variance of the student-focused approach to teaching can be predicted by self-efficacy beliefs in teaching, inadequacy in teacher-student interaction, exhaustion and stress (adjusted $R^2 = .417$, $F (4, 110) = 21.41$, $p < .001$). In these predictor variables, two were statistically significant: self-efficacy beliefs in teaching and inadequacy in teacher-student interaction (Table 5.4-3).

Table 5.4-3. Standardised coefficients of predictor variables on the student-focused approach to teaching scale.

Variable	Standardised coefficients (Beta)	t	*p*
Constant		3.07	.003
Self-efficacy beliefs in teaching	.64	8.16	< .001
Inadequacy in teacher-student interaction	.25	3.20	.002
Exhaustion	-.16	-1.77	.080
Stress	-.06	-.66	.513

On the teacher-focused approach to teaching scale, 12.1% of the total variance of the teacher-focused approach to teaching can be explained by the predictor variables (adjusted $R^2 = .121$, $F (4, 110) = 4.94$, $p = .001$). Only one predictor variable, inadequacy in teacher-student interaction, had a statistically significant standardised coefficient (Table 5.4-4).

Table 5.4-4. Standardised coefficients of predictor variables on the teacher-focused approach to teaching scale.

Variable	Standardised coefficients (Beta)	t	*p*
Constant		2.96	.004
Self-efficacy beliefs in teaching	.11	1.17	.245
Inadequacy in teacher-student interaction	.40	4.19	< .001
Exhaustion	.06	.56	.580
Stress	-.05	-.50	.618

Self-efficacy beliefs in teaching and burnout in three teacher educator groups (Study III)

Study II revealed three clusters of Chinese teacher educators according to their approaches to teaching. In *Study III*, the mean scores and standard deviations of their reported self-efficacy beliefs in teaching, burnout and stress were calculated based on these three clusters (Table 5.4-5). Z-scores were applied since different scales were used in the items (Figure 6).

Table 5.4-5. Means and standard deviations of self-efficacy beliefs in teaching and burnout per cluster.

Cluster	Self-efficacy beliefs in teaching (5-point Likert scale)		Burnout and stress: Inadequacy in teacher-student interaction (5-point Likert scale)		Exhaustion (7-point Likert scale)		Stress (10-point Likert scale)	
	M	**SD**	**M**	**SD**	**M**	**SD**	**M**	**SD**
Cluster 1_{China}	4.44	.56	1.61	.71	2.67	1.37	4.68	2.72
Cluster 2_{China}	4.40	.58	2.22	1.13	3.25	1.75	5.14	2.96
Cluster 3_{China}	3.74	.90	1.66	.61	3.54	1.74	5.52	2.77

Note: Cluster 1_{China} = teacher educators with a student-focused approach to teaching, Cluster 2_{China} = teacher educators with a dissonant approach to teaching, Cluster 3_{China} = teacher educators with a vague approach to teaching.

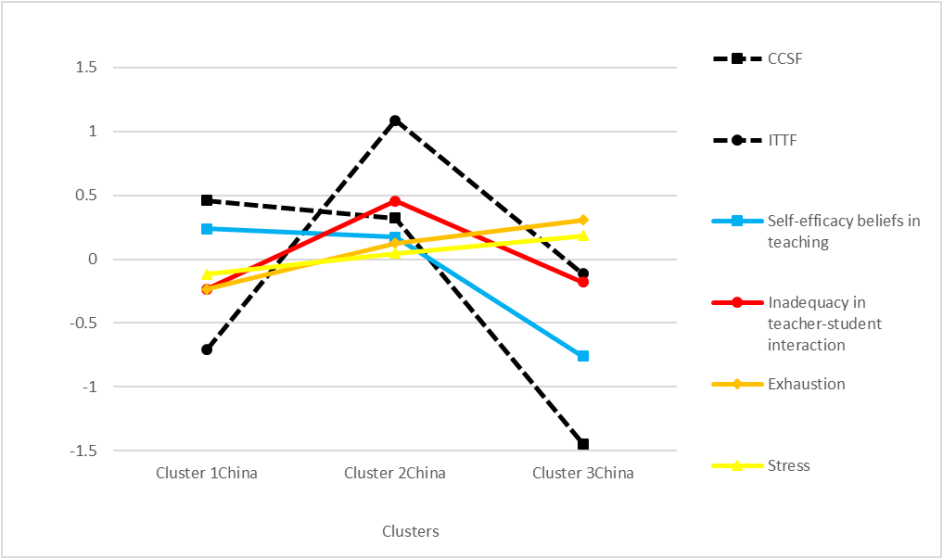


Figure 6. Z-scores of the student-focused and teacher-focused approaches to teaching, self-efficacy beliefs in teaching and burnout of the three clusters.

Note: Cluster 1_{China} = teacher educators with a student-focused approach to teaching, Cluster 2_{China} = teacher educators with a dissonant approach to teaching, Cluster 3_{China} = teacher educators with a vague approach to teaching.

In the next step, one-way ANOVA revealed statistically significant differences between the three clusters concerning their reported self-efficacy beliefs in teaching ($F(2, 112) = 10.92, p < .001$) and experiences of inadequacy in teacher-student interaction ($F(2, 112) = 6.16, p = .003$). No difference was found in their experiences of exhaustion and stress. Further analyses through the Dunnett T3 post hoc tests showed that on self-efficacy beliefs in teaching, the teacher educators with a student-focused approach to teaching (Cluster 1_{China}) and the ones with a dissonant approach to teaching (Cluster 2_{China}) scored statistically significantly higher than teacher educators with a vague approach to teaching (Cluster 3_{China}). Cluster 1_{China} had a higher score than Cluster 2_{China}, but the difference was not statistically significant. Concerning their experiences of inadequacy in teacher-student interaction, Cluster 2_{China} scored statistically significantly higher than Cluster 1_{China} and Cluster 3_{China}. Cluster 3_{China} had a higher score than Cluster 1_{China}, but it was not statistically significant (Table 5.4-6).

Table 5.4-6. Post hoc tests of self-efficacy beliefs in teaching and inadequacy in teacher-student interaction of the three clusters.

	Self-efficacy beliefs in teaching		**Inadequacy in teacher-student interaction**	
	Mean difference	***p***	**Mean difference**	***p***
Cluster 1_{China} – Cluster 2_{China}	.04	.976	-.61	.016
Cluster 1_{China} – Cluster 3_{China}	.70	.003	-.05	.986
Cluster 2_{China} – Cluster 3_{China}	.66	.007	.56	.042

Note: Cluster 1_{China} = teacher educators with a student-focused approach to teaching, Cluster 2_{China} = teacher educators with a dissonant approach to teaching, Cluster 3_{China} = teacher educators with a vague approach to teaching.

Concerning approaches to teaching in the student-focused and teacher-focused dimensions, the analyses revealed that the self-efficacy beliefs in teaching had the most and positive influence on the student-focused approach to teaching. In other words, teacher educators who had higher scores on the student-focused approach to teaching also showed higher scores on their self-efficacy beliefs in teaching. While no relationship was found between their reported teacher-focused approach to teaching and self-efficacy beliefs in teaching. Teacher educators' experiences of inadequacy in teacher-student interaction influenced the most and positively on their teacher-focused approach to teaching. This meant that teacher educators who scored higher on their teacher-focused approach to teaching also had experienced more inadequacy in interaction with their students. Furthermore, a positive relationship was also found between their inadequacy in teacher-student interaction and the student-focused approach to teaching, which indicated a complex situation concerning teacher educators' approaches to teaching and their experiences of inadequacy when interacting with their students. Exhaustion was found to be negatively related to teacher educators' student-focused approach to teaching in the correlation analysis. However, no other results were revealed in further analysis. Finally, no relationship was found between teacher educators' experiences of stress and their reported approaches to teaching.

5.5 Summary of the results

This dissertation has contextualised the research-teaching nexus and integration, and approaches to teaching at the teacher educator individual level in the academic teacher education of universities. Considering teacher educators' crucial role in educating future teachers and advancing educational research, it explored teacher educators' reported research-teaching closeness, their teacher/researcher role, and their reported approaches to teaching, self-efficacy beliefs in teaching and burnout, and practices of research-teaching integration. The correlations between these variables were investigated.

Three sub-studies were conducted, and the main findings were as follows:

1. Similarities were revealed among Finnish and Chinese teacher educators concerning their work in teaching and research. Though varied in frequency, a close research-teaching nexus was most frequently mentioned in both contexts. Meanwhile, the role of being teachers more than researchers was reported most often in both countries. Six forms of research-teaching integration were found among Finnish teacher educators.
2. Teacher educators from Finland and China had differences, but also shared similarities in their reported approaches to teaching.
   a) Differences: Finnish and Chinese teacher educators reported differently in the components of the student-focused and teacher-focused approaches to teaching. Finnish teacher educators thought that information presentation was included in the teacher-focused approach to teaching, as the assumptions made by other scholars in Western countries. While Chinese teacher educators reported that information presentation was one element of the student-focused approach to teaching, it did not belong to the teacher-focused approach.
   b) Similarities: Teacher educators from both countries had higher scores on the student-focused approach to teaching than the teacher-focused approach. Furthermore, Finnish and Chinese teacher educators reported similar kinds of approaches to teaching. Three kinds of approaches to teaching, i.e., the student-focused approach to teaching, the dissonant approach to teaching and the vague approach to teaching, were revealed among teacher educators from both countries.
3. It is revealed in the Chinese context that the more student-focused teacher educators were in their approaches to teaching, the closer they experienced the relationship between their research and teaching. No relationship was revealed between teacher educators' reported approaches to teaching and their teacher/researcher role in either of the research contexts. No difference was found concerning how teacher educators integrated research and teaching when they applied different approaches to teaching.
4. Teacher educators' reported self-efficacy beliefs in teaching were positively related to their reported student-focused approach to teaching. Meanwhile, no relationship was found between self-efficacy beliefs in teaching and teacher-focused approach to teaching.
5. The relationship between teacher educators' reported approaches to teaching and experiences of burnout was complex. Teacher educators' experiences of inadequacy in teacher-student interaction were positively related to both the student-focused and teacher-focused approaches to teaching. Their experiences of exhaustion were negatively related to the

student-focused approach to teaching. Finally, no relationship was found between their reported approaches to teaching and experiences of stress.

6 Discussion

6.1 Methodological reflections

The analyses in three sub-studies

A mixed-methods approach was applied in this thesis. Along with quantitative and qualitative research, mixed-methods research is recognised as the third major research paradigm (Johnson, Onwuegbuzie, & Turner, 2007). It provides an important approach for researchers to undertake deep analysis of the data and use one method to verify and supplement findings stemming from the other method (Onwuegbuzie & Leech, 2004). In the present study, the qualitative analysis provided answers to the question of how teacher educators integrate research and teaching. The quantitative analysis supported the exploration of teacher educators' research-teaching integration by providing evidence on how teacher educators reported approaching teaching, and how their reported self-efficacy beliefs in teaching and burnout influenced their approaches to teaching. The qualitative data were further quantified to explore whether the research-teaching integration was related to approaches to teaching.

A survey questionnaire was applied. The open-ended question allowed the participants to use their own words to express their ideas and practices of research-teaching integration. The data were analysed with the qualitative content analysis adopting an abductive strategy (Chamberlain, 2006; Haig, 2005; Shank, 1987; Timmermans & Tavory, 2012). The exclusive categories of research-teaching integration were revealed with the analysis in several phases. With the abductive strategy, the analysis started with the existing theory generated from previous studies, then continued with the data collected to find a fit between the data and the theory. The aim was to find verification of the existing theory or produce a new theory with an inductive analysis of the data (Timmermans & Tavory, 2012). *Study I* started with the five forms of research-teaching integration generated from previous studies, after analysing the data, one more form was found. The abductive strategy strengthened the validity of the content analysis by combining both the data-grounded analysis and the theory-guided analysis (Haig, 2005). This thesis relied mainly on the quantitative approach to explore the relationship between the phenomena being studied. Scale items investigating teacher educators' reported approaches to teaching, self-efficacy beliefs in teaching and burnout were drawn from well-developed and validated instruments.

Since the present thesis study was conducted in two countries, attention was given to the data collection procedures and data analysis methods in both contexts to keep the consistency. The questionnaire was modified to the specific research context. The Finnish and Chinese translations of the questionnaire were checked

by scholars working in the same research field as the doctoral student in respective Finnish and Chinese contexts. Same quantitative research methods were adopted in the two research contexts when the same phenomena were explored.

The original proposal was to design a comparative study to explore the differences and similarities of teacher educators working in Finland and China. The comparative study would have allowed us to deepen our understanding of how the different settings, such as the national context, influence teacher educators' work as teachers and researchers (see Esser & Vliegenthart, 2017). Importantly, the comparative analysis needs to be built on the common theoretical framework and equivalent conceptualisation, otherwise, the study would be in the danger of simply describing the educational practice of teachers in different countries (Esser & Vliegenthart, 2017; Green, 2003; Osborn, 2004; Pickvance, 2005). However, one educational term may not have the same meaning in different cultures (Osborn, 2004). As one of the central and fundamental conceptions, the student-focused and teacher-focused approaches to teaching were revealed differently in Finland and China, which meant that the basis for comparison is missing. Though this thesis provided some discussion on the differences and similarities of Finnish and Chinese teacher educators from the comparative angle and the possible reasons for it, adjustments to the study design were made. The phenomena being studied were explored in the according context considering the unique nature of the context, rather than roughly comparing them.

The three sub-studies focused on either the Finnish or the Chinese teacher educators. Research-teaching integration was explored in Finland in consideration of the fact that the research-based teacher education has been implemented in Finland for over 40 years. Finnish teacher educators would provide rich descriptions of how they integrate research and teaching because they could have thorough understandings and plentiful experience of doing so (Krokfors et al., 2011). How self-efficacy beliefs in teaching and burnout relate to approaches to teaching were analysed with the data from China. The thought is that the Chinese teacher educators are working in a changing context with different ideological impacts from their own tradition and the West (Hu et al., 2014; Sang et al., 2012), which might make them question their teaching ability and thus experiencing burnout. Approaches to teaching, as one of the core concepts, were explored in both countries. The results showed how this concept varies when the context is different, which could provide evidence for the previous discussion concerning the context-dependent nature of approaches to teaching (Posser & Trigwell, 2006).

Methodological triangulation strengthened the validity and reliability of the study (Turner & Turner, 2009). The investigator triangulation was applied in the whole study process (Archibald, 2016; Turner & Turner, 2009). For example, the survey questionnaire was developed by the doctoral student and the supervisors together, to avoid individual biases. The trustworthiness of the qualitative analysis was guaranteed with a systematic and rational analysis of the data by the doctoral

student and her supervisors (Archibald, 2016; Turner & Turner, 2009). The internal consistency of the scale items was assessed by the Cronbach's alphas, which ranged from .69 to .86. Given the small sample size and the low number of items on self-efficacy beliefs in teaching and burnout scales, the reliability of the Likert-scale items was considered to be good on the student-focused approach to teaching and self-efficacy beliefs in teaching scales, and acceptable on other scales (George & Mallery, 2019; Streiner, 2003).

The rich and detailed descriptions of the data analysis procedures and decision-making were presented to show the trustworthiness of the analysis. Furthermore, the results were discussed and reviewed in the scholar community, such as research seminars with the doctoral student's supervisors and other colleagues, international conferences and by reviewers of the sub-study articles (Creswell & Miller, 2000). The study explored teacher educators' reported experiences, which may change over time and in different contexts, the interpretation of the research findings was provided in full consideration of the specific study context. Thus, caution is needed when thinking about the inference transferability of the study. Nonetheless, this dissertation has provided some insightful results as a starting point to further explore teacher educators' work in research and teaching, their professional identities as teachers and researchers, and how the internal and external factors influence their work.

The use of Approaches to Teaching Inventory (revised version) in different research contexts

Based on the 16-item Approaches to Teaching Inventory (ATI; Trigwell & Prosser, 2004), Trigwell and his colleagues developed the 22-item ATI-R (Trigwell et al., 2005). The ATI (Trigwell & Prosser, 2004) was originally designed to explore approaches to teaching by university science teachers. The ATI (Trigwell & Prosser, 2004) and its revised version (Trigwell et al., 2005) are now generally used across a range of disciplines (Meyer & Eley, 2006; Tezci, 2017). The original English and the translated versions of the inventory have been widely applied in different countries and research contexts (Eley, 2006; Goh, Wong, & Hamzah, 2014; Monroy, González-Geraldo, & Hernández-Pina, 2015; Päuler-Kuppinger & Jucks, 2018; Stes, De Maeyer, & Van Petegem, 2010; Stes & Van Petegem, 2014; Tezci, 2017), including Finland (Postareff et al., 2007) and China (Hu et al., 2014; Zhang, 2001). There has been criticism and discussion about the applicability of the inventory (Harshman & Stains, 2017; Meyer & Eley, 2006). Nevertheless, the reliability and validity of the English and translated versions of ATI (Trigwell & Prosser, 2004) and ATI-R (Trigwell et al., 2005) have been confirmed in previous studies (Goh et al., 2014; Päuler-Kuppinger & Jucks, 2018; Stes et al., 2010; Tezci, 2017; Trigwell & Prosser, 2004).

In line with previous studies (Goh et al., 2014; Harshman & Stains, 2017; Stes et al., 2010), this thesis study showed that the originally designed structure of the ATI-R (Trigwell et al., 2005) could change when being used in a different research context. Though two main scales were revealed in line with the scales developed by Trigwell et al. (2005), modification of items was needed in both scales. Some items were deleted and some were not on the scale that they were originally designed for (see also Goh et al., 2014; Monroy et al., 2015; Stes et al., 2010). Researchers indicated that these changes could be due to the working context of the teachers and they have different understandings of the wording of the inventory (Stes et al., 2010). Previous studies (Goh et al., 2014; Stes et al., 2010) have suggested that further research concerning the structure of the inventory in different cultures is needed.

Extra caution must be exercised when applying the inventory in different research contexts (Harshman & Stains, 2017). Suggestions can be summarised based on the application of the ATI-R (Trigwell et al., 2005) in this thesis study. Firstly, the items need to be adjusted and tailored to the specific research context to avoid losing validity and reliability due to the mismatch between the wording and the research context (see Monroy et al., 2015; Prosser & Trigwell, 2006; Stes et al., 2010). Back-translation from the translated language to English could warrant the consistency of the inventory between the translated version and the original one. Secondly, the inventory is context-dependent, and the structure of the inventory may differ in other research contexts (cf. Goh et al., 2014). It is suggested that factor analysis could be conducted to check its factor structure in the particular research context (see also Stes et al., 2010; Tezci, 2017). Thirdly, the inventory does not aim to classify teachers as the ones with teacher-focused teaching and the others with student-focused teaching. It explores teachers' approaches to teaching at certain points and does not assess their general orientations in teaching (Monroy et al., 2015; Prosser & Trigwell, 2006; Stes et al., 2010; Tezci, 2017). Thus, the respondents were asked to think of a specific subject or course while answering the questionnaire (Prosser & Trigwell, 2006). Furthermore, the specific teaching context and cultural difference need to be considered when analysing the data collected with the inventory (Stes et al., 2010; Tezci, 2017).

Research ethics

Participation in the three sub-studies was voluntary. At the beginning of the questionnaire, clear instructions, basic information and aims of the study were presented to the participants so they would have sufficient information to make decisions about participation. Contact information about the doctoral student and supervisors were provided. Research consent was obtained when the participants returned the questionnaire. The participants had the right to withdraw from the

study at any time during the process. The privacy and anonymity of the participants were guaranteed and all their personal information and identifiers were left out from the report on the research. The participants cannot be identified from the text of the three publications and this dissertation. The participants were treated with respect, and none of the three sub-studies harmed participants (Barrett, 2000; Burgess, 2005; Cohen, Manion, & Morrison, 2007).

The design of the dissertation study, data collection and analysis process, the report of results were carried out following a thorough and foundational analysis of previous studies to guarantee the reliability and credibility of the whole study (Barrett, 2000; Cohen et al., 2007). The ethical guidelines of the Finnish Advisory Board on Research Integrity were followed in Finland (2012). Correspondingly, the ethical guidelines of the universities studied in China were followed. The returned paper questionnaires were stored in a locked cabinet; the electronic data were saved locally. The analysis of the quantitative data, the transcription, coding and analysis of the qualitative data was undertaken by the doctoral student and her supervisors to avoid the data being acquired by a third party. This whole study was conducted with integrity, accuracy and honesty.

Limitations of the study

One limitation is concerned with the study sample. Participation in the study was voluntary. This might mean that only those teacher educators concerned about their research-teaching nexus and approaches to teaching returned the questionnaire. This could influence the data and the sample may be biased. For example, the higher score on the student-focused approach to teaching in both countries may be because the teacher educators who answered the questionnaire were more interested in developing their teaching in a student-focused way. Furthermore, the sample size was small. Though *Study I* involved participants from eight universities in Finland, only 101 teacher educators participated and the response rate was 12%. This might be because the study did not activate the participation of teacher educators with less interest in the research topics to participate. In *Studies II* and *III*, 115 teacher educators from two teachers' universities in the north-eastern part of China participated in the survey. Though the two universities can be seen as the representatives of teacher education in the regional area, a bigger sample with a better representation is needed, especially considering the different economic development and diverse culture of the different areas in China.

Another limitation is concerned with the data collection methods. A questionnaire was used to involve as many participants as possible. However, through participants' self-estimation on their situations and self-report to the questions, limited information is available regarding how they conceptualised the conceptions and issues explored in their own context. Meanwhile, it was not clear how they understood the items and questions of the questionnaire in their local working

context. Concerning the items in the questionnaire, only three items were developed to explore teacher educators' reported research-teaching closeness, their teacher/researcher role, and their practice of research-teaching integration, which provide a general picture of how they viewed their work of teaching and research. A thorough study design is needed to investigate this issue further.

6.2 Theoretical reflections and synthesis of the findings

This thesis contributes to the literature on research-teaching integration in teacher education, and teacher educators' approaches to teaching to educate the future generation of teachers. The phenomena were analysed from the viewpoint of teacher educators at two contextual levels. Firstly, the academic university-based teacher education context was considered as a shared backdrop of Finland and China and a vital factor influencing teacher educators' teaching and research. Secondly, the three sub-studies were designed and conducted in the respective Finnish and Chinese contexts. Their particular contextual factors were discussed to explain the revealed research-teaching integration and approaches to teaching. Overall, this thesis generated new insights for understanding the interrelationship between research and teaching in academic teacher education and to support teacher educators' research and teaching work in varied contexts.

Teacher educators' research-teaching integration

The discussion about research-teaching integration in teacher education is a response to the changes in the field and the demanding challenges university-based teacher educators face while doing their work (Geerdink et al., 2016; MacPhail & O'Sullivan, 2019; MacPhail et al., 2019; Vanassche, Kidd, & Murray, 2019). Many studies attempting to promote teacher educators' professional development and build a strengthened research-teaching nexus for them have been conducted (Geerdink et al., 2016; Kelchtermans et al., 2018; MacPhail et al., 2019; Tack & Vanderlinde, 2014; Van Der Klink et al., 2017). However, all these efforts need to be based on how teacher educators have considered their work and their roles in the academic working context. Thus, the present thesis study started the exploration of teacher educators' research-teaching integration by firstly revealing how they reported their research-teaching closeness and their professional roles as teachers and/or researchers.

Internationally, there are contentions about teacher educators working as researchers and there is trepidation that teacher educators' research responsibilities might impede their teaching and thus cause them research-teaching conflict (Lunenberg & Willemse, 2006). The mismatch between teacher educators' self-awareness and the institutional expectations may cause teacher educators to experience difficulty in their work (Martin, 1997). For example, in China, universities

have been stressing the research participation and academic publications in their institutional development strategies and expect teacher educators to focus more on research (Dai & Goodwin, 2013; Zhu, 2010; Zhu & Han, 2006). This policy may discourage the teacher educators who have a stronger belief in the teaching role and favour teaching more over research. Researchers argue that teacher educators' engagement in research can be encouraged by improving their research knowledge and skills (Murray & Vanassche, 2019). According to teacher educators' self-reported role of being more as teachers in the present study, we argue that research and teaching need to be seen as intertwined activities. Teacher educators may be more willing to do research if it is aligned with their existing identities, everyday practice and concerns, such as their responsibilities as teachers in teacher education (Geerdink et al., 2016; Hill & Haigh, 2012; MacPhail & O'Sullivan, 2019; Robinson & McMillan, 2006).

Similar findings in Finland and China were found that a close research-teaching relationship was confirmed by the largest portion of teacher educators, though it was reported less often by Chinese teacher educators. The tight research-teaching nexus Finnish teacher educators experienced could be attributed to the local workplace context of research-based teacher education. The research-based approach is a well-developed organising theme in Finnish teacher education to support teacher educators' work in teaching and research and to integrate these two tasks (Toom et al., 2008, 2010). This demonstrated that the institutions' policy and development strategies have a great effect on teacher educators' research-teaching nexus (see also Hattie & Marsh, 1996). However, researchers warned us that it is also possible that teachers consider the research-teaching nexus as self-evident and automatic (Robertson & Blackler, 2006). This could mean that teacher educators may have reported a close research-teaching nexus because they naturally believed in it without having a thorough reflection of their research and teaching work. The research question on how Finnish teacher educators integrate research and teaching offered us some insights on how they practised the research-based approach in teaching, and furthermore, how they practised their close research-teaching nexus.

Teacher educators demonstrated freely how they integrated research and teaching, and six ways of research-teaching integration were found. Teacher educators are firstly perceived as teachers. They integrated research with their teaching content and methods. The most common way was teacher educators transmitting research knowledge to student teachers through teaching content. Because the study did not specify the kind of courses the participants could report, within this main approach to integrate research into teaching, teacher educators held different teaching aims and used different aspects of research knowledge. Overall, this way of research-teaching integration reflects a research-teaching nexus at the tangible level (Neumann, 1992). Two approaches were taken when teacher educators integrated research with their teaching methods. Firstly, unique to teacher educators,

they can improve their own teaching methods and practice based on research results. As researchers in teacher education, they are familiar with the recent research on pedagogy. Thus, they can use the recently-developed theory of teaching methods in practice. Secondly, some teacher educators mentioned using the inquiry-oriented approach in teaching, which mirrors the research-teaching nexus at the intangible level (Neumann, 1992). However, teacher educators need to have a thorough preparation to implement inquiry-oriented teaching and learning (Towers, 2010), so it was not mentioned frequently by the participants.

Accordingly, two aspects of research-teaching integration were reported by teacher educators while their researcher role was more active. Teacher educators were researchers in teacher education. They reported conducting practitioner research on their own practice to develop their teaching directly (see Berry, 2004). Meanwhile, their research topic covered broad themes concerning what they teach, and other issues in teacher education in general. Their teaching thus functioned as a research site for them to collect data and research inspirations. Furthermore, student teachers' involvement in research was encouraged in research-based teacher education (see Niemi & Nevgi, 2014). In this case, both teacher educators and student teachers' academic disposition and research competencies are stressed (Visser-Wijnveen et al., 2010).

Several teacher educators mentioned a supportive relationship between research and teaching. The reason they did not present specific examples to illustrate their research-teaching integration (as suggested in the questionnaire that they were encouraged to do) was not demonstrated. As mentioned earlier, some teacher educators may consider the research-teaching nexus as mutually enhanced and believe in the research-based teacher education in Finland, but they do not implement the research-based approach in teaching in explicit ways (Aspfors & Eklund, 2017; Byman et al., 2009; Krokfors et al., 2011). Most teacher educators reported more than one way to integrate research and teaching (see also Pan, Cotton, & Murray, 2014). There is no best way to link research and teaching (Visser-Wijnveen et al., 2010). The above-mentioned six aspects are interrelated. They revealed that in Finnish research-based teacher education, all the courses and components of teaching are related to research in one way or another (Kansanen, 2014; Toom et al., 2008, 2010). The findings indicated that teacher educators considered teaching future teachers as their main task, but they believed in a close research-teaching relationship. Practically, they applied various ways to integrate research and teaching. Based on these understandings, further discussions on how we can use research to help teacher educators to improve their teaching can be continued.

Exploring research-teaching nexus is difficult, as theoretically research and teaching can be interpreted differently, which leads to different measures (Brew & Boud, 1995), and the analysis is based on different principles (Verburgh et al., 2007). Researchers argue that research and teaching need to be defined more flexibly and broadly to include the research-teaching nexus in a wider range of forms

(Brew, 2010; Healey, 2005a; Neumann, 1992). This thesis study did not restrict research and teaching to certain limited definitions, especially considering that Finnish universities provide teacher educators with a high degree of autonomy in their work (Hökkä et al., 2012).

Differences and similarities between Finnish and Chinese teacher educators' reported approaches to teaching

Teacher educators in Finland and China reported differently concerning the components of student-focused and teacher-focused approaches to teaching. Chinese teacher educators considered teachers presenting information to students as one element of the student-focused approach to teaching, while Finnish teacher educators did not reveal this pattern. Theoretically, researchers mentioned that the student-focused approach to teaching could be combined with features from the teacher-focused approach (Postareff, 2007; Trigwell et al., 2005). Meanwhile, how teachers approach teaching could correlate to how they understand what knowledge is and how knowledge can be acquired. Having foundations in the ancient Chinese culture, knowledge is considered to be relatively fixed and obtained through mastery of the content of the textbooks. Though this understanding has been changing, it still has a fundamental influence on teaching and learning in modern China (Tan, 2015). In accordance with the 'paradox of the Chinese learner' (Watkins & Biggs, 1996), student teachers acquire conceptual change and development of understanding of the knowledge (the deep approach to learning) through repetition and memorisation of learning content. Accordingly, teacher educators would provide their students with the knowledge and information as content bases for them to memorise and consider this to be the student-focused approach to teaching. In this case, information presentation is aligned with student-activating teaching strategies. Teacher educators' focus is not on 'presenting' the information, but on how student teachers will process the information (Trigwell et al., 2005).

Besides the differences, teacher educators in Finland were revealed with three approaches to teaching that were similar to those in China. Firstly, a student-focused approach to teaching was revealed in both countries. Meanwhile, the teacher-focused approach was not found in either country. One reason could be that the participation of the study in both countries was voluntary, which might mean that only the teacher educators who were interested in and cared about their teaching, and thus were more likely to adopt a student-focused approach to teaching, participated in the study. Another potential reason might be the disciplinary differences in approaches to teaching revealed in previous studies. Teacher education is a soft discipline, in which teacher educators are more likely to apply a student-focused approach to teaching (Kemp, 2013; Lindblom-Ylänne et al., 2006). As mentioned earlier, one reason specific in the Chinese context was that

teachers presenting information to students was seen as an element of the student-focused approach to teaching, rather than the teacher-focused approach. It might show more evidence of the teacher-focused approach to teaching in the Chinese context if it is included in the teacher-focused approach to teaching scale.

It is noteworthy that two dissonant approaches to teaching were found in Finland and China. In a previous study, Postareff et al. (2008) described a group of Finnish university teachers holding a dissonant approach to teaching. They indicated that the dissonance might be because the teachers' teaching is transitioning from the teacher-focused to the student-focused approach (Postareff et al., 2008). Similarly in China, the current educational reform is the transition phase for teacher educators. Thus, they combine the encouraged student-focused approach with the old teacher-focused approach in teaching. Some teacher educators were revealed applying a dissonant approach to teaching with relatively low scores on both the student-focused and teacher-focused scales. This vague approach to teaching implies that they may be confused and have an unclear perception of their approaches to teaching. They are the group of teachers that needs extra attention, and the cause for the vagueness needs further exploration.

A study on secondary school physics teachers in the Netherlands showed that they hold a teaching belief consisting of teacher-focused and student-focused beliefs. The researchers further explained that teachers possess the 'pedagogical sensitivity' to identify the appropriate teaching in the particular teaching situations that sometimes require more of the teacher-regulated instructional strategies (Belo, Van Driel, Van Veen, & Verloop, 2014). Seemingly, besides the possible explanations for the dissonant approaches to teaching provided above, teacher educators in this study might have different understandings of the student-focused and teacher-focused approaches to teaching rather than the original definitions and consider that a combination of both is necessary when they face student teachers with various learning needs. The dissonance revealed in approaches to teaching indicated that the study of approaches to teaching needs to go beyond the student-focused and teacher-focused definitions (cf. Belo et al., 2014).

Approaches to teaching are context-specific issues to be explored (Posser & Trigwell, 2006). Given the two research contexts, this thesis contributes to the discussion of how we might understand the same educational notions of student-focused, teacher-focused, and dissonant approaches to teaching in different national and cultural contexts. Researchers argue that China has 'borrowed' the educational notions from the West, modified and adapted the notions with the local culture under the epistemological basis of its own (Tan, 2015). In the Chinese context, teachers as knowledge experts are responsible for presenting the knowledge to students and monitoring students' acquisition of the knowledge. The teacher-dominated pedagogy regulates students' deep approach to learning, thus is seen as student-focused, which is clearly different from the Western ideas of student-focused approach to teaching (Mok, 2006; Tan, 2015; Tan & Chua, 2014).

The exploration of approaches to teaching in China illustrates the complexity of approaches to teaching resulting from the interactions between educational theory, teachers' epistemology, the local, national and cultural contexts.

The relationship between teacher educators' reported research-teaching integration and approaches to teaching

This thesis study has explored whether teacher educators consider their research-teaching closeness and their roles as teachers and/or researchers differently while teaching in different approaches. A positive relationship between teacher educators' student-focused approach to teaching and a close research-teaching nexus was found. This is in line with a previous study revealing that teachers believing in a student-focused approach to teaching hold a stronger belief about the role of research in ideal teaching (Hu et al., 2014). How teachers perceive teaching and learning, and the research-teaching nexus is related to their perceptions of knowledge creation and transmission (Brew, 1998; Griffiths, 2004; Robertson, 2007). Researchers have described several forms of research-teaching nexus that correspond with the variation of approaches to teaching from the student-focused to teacher-focused (Brew, 2002, 2003; Healey, 2005a; Robertson, 2007). The student-focused teacher educators are more likely to relate research and teaching in a student-focused and deeply integrated way, as Brew (2002, 2003) described, in the second model of research-teaching nexus. Teacher educators with the student-focused approach to teaching tend to see research and teaching in a mutual-enrichening relationship. On one hand, research enhances their teaching. For example, research can provide teachers with opportunities to interact with students and stimulate students' interest in learning. On the other hand, teaching provides teacher educators with thoughts and inspirations for research (Elen et al., 2007). However, a relationship between the teacher-focused approach to teaching and the research-teaching closeness was not revealed.

The analysis did not reveal any statistically significant relationship between teacher educators' reported teacher/researcher role and approaches to teaching. However, two factors, workload and the type of universities they work at, were revealed to have a relationship with how they considered their roles. For most teacher educators in this thesis study, their main duty was research and teaching. *Study II* showed that in the Chinese context, teacher educators' reported roles were consistent with the kind of work they engaged in. The teacher educators who reported themselves more as being teachers were the ones focused more on teaching. Meanwhile, the ones who reported themselves more as being researchers engaged more in research. Similar results were also found with teacher educators from Finland. Furthermore, *Study II* revealed that compared to the teacher educators in the provincial key university, those from the national key university reported themselves more as researchers and less as teachers. The research-teaching nexus is

influenced by the institutional policy and management strategy (Brew, 2010; Hill & Haigh, 2012). The national key university is a research-intensive university and a model of teacher education reform in the area, which means that the university stresses research in its development strategy, and teacher educators in this university would get more opportunities to do research. Therefore, they believed themselves more of researchers.

In terms of the relationship between research-teaching integration and approaches to teaching, we can observe that teacher educators in different approaches to teaching groups varied in their preferred ways to integrate research and teaching. However, the differences were not statistically significant. The small sample size might be one reason. Another explanation could be the approaches to teaching revealed in the study. Two of the three approaches to teaching were dissonant. This means that many teacher educators in *Study I* combined the student-focused and teacher-focused approaches in teaching, accordingly, they may apply multiple ways to integrate research and teaching. Overall, the relationship between how teacher educators integrate research and teaching and their approaches to teaching was not found.

Teacher educators' reported approaches to teaching, self-efficacy beliefs in teaching and burnout

Teacher educators in China reported a high level of self-efficacy beliefs in teaching. Furthermore, the relationship between the student-focused approach to teaching and self-efficacy beliefs in teaching is considered to be reciprocal. The statistics revealed that the more teacher educators approached teaching in a student-focused way, the stronger self-efficacy beliefs they reported. Meanwhile, among the factors that were tested, self-efficacy beliefs in teaching had the positive and strongest effect on the student-focused approach to teaching. This indicates that in practice, on one hand, teacher educators with strong self-efficacy beliefs in teaching have confidence in their teaching ability, thus are more willing to interact with students to promote the students' personal development, i.e., approach teaching in a student-focused way (Guskey, 1988; Pitkäniemi, 2002; Temiz & Topcu, 2013). On the other hand, teacher educators with a student-focused approach to teaching are more likely to acquire a high level of self-efficacy beliefs in teaching through interaction with students and helping them to accomplish conceptual development. This is in line with a recent study indicating that teachers' instructional practice is not only affected by their self-efficacy, but can also affect their self-efficacy (Choi, Lee, & Kim, 2019).

A previous study revealed a moderate degree of burnout on the three dimensions (emotional exhaustion, depersonalisation, and personal accomplishment) among industrial and technical teacher educators (Brewer & McMahan, 2003). Similarly, this thesis study found that the Chinese teacher educators reported a

moderate level of exhaustion and stress, but a low level of experienced inadequacy in teacher-student interaction. Concerning how teacher burnout influences teacher educators' approaches to teaching, firstly, the statistical analysis showed a complex situation concerning the positive relationships between teacher educators' experiences of inadequacy in teacher-student interaction and both the student-focused and teacher-focused approaches to teaching. Teacher educators with the student-focused approach to teaching are the ones interacting with students more often and thus are more likely being exposed to challenging situations and feeling inadequate in their ability to interact with students. Nevertheless, previous studies explained that teachers with the student-focused approach to teaching experience more positive emotions, feeling enthusiasm and enjoyment from teaching (Heikonen, Pietarinen, Pyhältö, Toom, & Soini, 2016; Postareff & Lindblom-Ylänne, 2011; Trigwell, 2012). Thus, though they experience inadequacy when interacting with students, they have positive attitudes about improving the situation, perhaps by approaching their teaching with more focus on students and interacting with them. However, the ineffective interaction with students may also lead to teacher educators moving their focus from students to themselves and their teaching, with less interaction with students to avoid the feeling of inadequacy. Meanwhile, the more teacher educators approach teaching in a teacher-focused way, the more likely they feel challenged when interacting with students and feel inadequate about their ability to interact with them.

As an important dimension of burnout, exhaustion was negatively related to the student-focused approach to teaching in the correlation analysis. It is plausible that emotionally exhausted teacher educators are less likely to apply a sophisticated student-focused approach to teaching (see Retelsdorf et al., 2010). However, other analyses did not further reveal how exhaustion affects teacher educators' approaches to teaching. Concerning teacher stress, this thesis study revealed only the positive relationship between stress and exhaustion, which was shown in a previous study (see Skaalvik & Skaalvik, 2010). How the feeling of stress influenced teacher educators' approaches to teaching was not found. Previous studies demonstrated that burnout and stress could influence teachers' teaching performance (Grayson & Alvarez, 2008; Skaalvik & Skaalvik, 2010), and teacher educators in China are working with increasing demands and pressure on their research and teaching work (Li, 2010; Xu, 2019; Yuan & Lee, 2014). It is necessary to consider that Chinese teacher educators' experiences of burnout and stress might influence their approaches to teaching. The study design did not lend itself to provide explanations for the results concerning the relationship between approaches to teaching, and exhaustion and stress. Overall, the results revealed a complex situation regarding the interaction between teacher educators' experiences of burnout and approaches to teaching, which strongly indicated that further exploration is needed.

6.3 Educational implications

The enhancement of teacher educators' research-teaching nexus

The present thesis study provided new insights on how teacher educators considered the relationship between their research and teaching and their roles as teachers/researchers, and how they implemented research-teaching integration. In light of these findings, researchers might reflect on how to build an intertwined research-teaching nexus in academic teacher education at both the institutional and individual levels.

Institutional support is critical. Besides the work teacher educators prefer to do, they need to finish the task the university assigns to them. Research-teaching conflict may occur when teacher educators' self-positioning is different from the university's expectations (Colbeck, 1998). The situation may get worse if the university cannot provide teacher educators with sufficient guidance and support to accomplish their research and teaching work (Lunenberg, 2010; Martinez, 2008; Zhu, 2010). Encouraging strategies to strengthen teacher educators' research-teaching nexus and integration could be involved in the institutional management strategies and development plans (Brew, 2010; Hill & Haigh, 2012). One of the reasons for teachers to see teaching and research as two separate tasks is that the rewards system functions separately concerning the funding of research and teaching (Brew, 2003; Colbeck, 1998). Accordingly, a research-teaching nexus can be strengthened, for example, by setting up a new funding system to encourage teacher educators' efforts to integrate research and teaching. A culture of research-teaching integration needs to be built in the university context (Hill & Haigh, 2012). Teacher educators need a scholarly community that does not treat them as the ones who teach and the ones who conduct research (Brew, 2010).

Specific strategies and programmes can be organised to support teacher educators' research-teaching integration. Researchers stressed the importance of professional development programmes for teacher educators to improve their research capacity (MacPhail et al., 2019; Murray & Vanassche, 2019). Based on the ways research-teaching integration were revealed in the study, it is argued that these programmes could be organised more specifically on improving teacher educators' skills to integrate research and teaching. Meanwhile, the proper workload should be arranged for individual teachers and with a flexible working timetable. Teacher educators could then have more control and autonomy over their teaching, the design and organising of their courses. It is important to remember that all these measures the institutions take need to be built on what the teacher educators have as strengths, and do not undermine the work they have been doing (MacPhail & O'Sullivan, 2019).

Correspondingly, efforts to enhance the research-teaching nexus are encouraged at the individual level with the teacher educators. Some specific suggestions

based on the ways of research-teaching integration of the teacher educators revealed in this thesis study can be made. Generally speaking, research should be integrated into teaching in a student-focused approach, as suggested in Healey's (2005a) model of designing curriculum. Moreover, in addition to teaching content, teacher educators should be encouraged more to integrate research with their teaching methods. Inquiry-based teaching should be recommended. It is important for teacher educators to be aware that high-quality guidance and instant feedback are necessary for ensuring the good learning experience of student teachers in the process (Niemi & Nevgi, 2014). Forming a supportive learning environment is vital for encouraging students to participate in research (Niemi, 2016). Furthermore, besides encouraging student teachers to work on the research topics that are currently the teacher educators' research focus, teacher educators need to relate the research to the student teachers' future work as teachers and encourage them to explore the issues related to their own interests and problems encountered (Aspfors & Eklund, 2017). Teacher educators are interested in exploring their own teaching and more attention needs to be paid to how they can use the research results to improve teaching.

The initiatives to support an integrated research-teaching nexus at the institutional and individual levels need to be coordinated. A constant reflection on the roles teacher educators play and the work they engage in would be helpful for them to position themselves, and find a fit between their personal development and the university's management plans. As mentioned above, the university is encouraged to give teacher educators more control over their work, teacher educators then are required to plan their teaching and research in organised ways to integrate the two parts. Even in one course of one individual teacher educator, the ways to integrate research and teaching vary, and multiple ways are applied. The several ways need to be linked systematically. The aims of research-teaching integration should be made more explicit to teacher educators (Aspfors & Eklund, 2017), especially for those who may not have a thorough consideration of their research-teaching nexus. A strengthened research-teaching nexus is needed to avoid redundant work and improve the work efficiency of teacher educators. It is guaranteed with support from the institutions and the implementation of research-teaching integration of individual teacher educators.

The development of teacher educators' approaches to teaching

Previous studies indicate that teachers need to be encouraged to employ more of the student-focused approach to teaching (Trigwell et al., 1999). This thesis study revealed that most teacher educators reported their approaches to teaching as being dissonant. They may combine the student-focused and teacher-focused approaches to teaching on purpose according to different teaching situations and stu-

dents. The attention should be paid to the ones who might have unclear perceptions of their teaching and thus revealing a vague approach to teaching. Pedagogical training is revealed to influence teachers' approaches to teaching (Gibbs & Coffey, 2004; Hanbury et al., 2008; Postareff et al., 2007, 2008; Stes et al., 2007). The effect can be enhanced if the training is tailored to the individual teacher educators (Stes & Van Petegem, 2014), considering not only their specific teaching environments but also a wider context, such as the cultural and national traditions. For example, teachers intending to present information to students is not necessarily a bad thing. The important task in the training is to improve teacher educators' skills to activate student teachers in learning to process the information.

The study found that in Finland, few teacher educators have participated in university pedagogical training programmes. It is probably because they considered themselves to be teachers majoring in teaching and teacher education, and thus with sufficient knowledge and skills to teach. However, on one hand, approaches to teaching are influenced by teacher educators' perceptions, on the other hand, they are affected by the external environments (Chen, 2015; Prosser et al., 2003). Teacher educators need to be encouraged to participate in pedagogical training to join in the continuous professional development concerning their teaching. More importantly, it could provide teacher educators with a culture and learning community to reflect on their perceptions and practice of approaches to teaching. Approaches to teaching should not be fixed; teacher educators need to be sensitive to the external requirements for the change and improvement in their approaches to teaching and be prepared to do so.

The enhancement of teacher educators' self-efficacy beliefs in teaching and reduction of burnout

This thesis provided some insights that, firstly, teacher educators can enhance their student-focused approach to teaching through improving their self-efficacy beliefs in teaching. Furthermore, by using the student-focused approach to teaching which relates to the students' conceptual change and development of understanding, teacher educators may feel effective in teaching. Thus, the use of a student-focused approach to teaching could in turn enhance teacher educators' self-efficacy beliefs in teaching (see also Choi et al., 2019). From this standpoint, the student-focused approach to teaching should be encouraged more among teacher educators.

Previous studies indicated that pedagogical training improves teachers' self-efficacy beliefs (Lumpe et al., 2014; Posnanski, 2002; Postareff et al., 2007). The training programmes could focus on improving teacher educators' skills to interact with students. For example, how to detect student teachers' learning needs and problems, how to react to students' challenging behaviours, and how to connect the teaching more to their needs as future teachers. The core idea is to improve

teacher educators' pedagogy towards a student-focused approach. Communication and interaction between teacher educators and student teachers are necessary and unavoidable. It helps teacher educators to know their students' learning needs and thus to adjust approaches to teaching to the students' approaches to learning promptly (Zhu, 2017). The influence mechanism between inadequacy in teacher-student interaction and teacher educators' approaches to teaching is unclear. Thus, caution is needed when encouraging teacher educators to interact with students.

Though this thesis study did not show how teacher exhaustion and stress influence teacher educators' approaches to teaching, precaution is necessary to avoid teacher educators' feeling of exhaustion and stress before it actually happens (Lackritz, 2004), especially new initiatives to shift teacher educators' routine practices as teachers are initiated. Teacher educators may need to put extra time and effort to adapt to the new requirements and thus feel exhausted. The increasing workload is one of the stressors leading to teachers' emotional exhaustion (Rajendran, Watt, & Richardson, 2020). Thus, having the proper workload is warranted to help prevent teacher burnout. Finally, the factors leading to teacher burnout may be different according to individuals and the specific contexts, which means that the strategies the universities adopt to support teacher educators need to target the individuals and their particular situations (Scott, 2019).

6.4 Implications for future research

The three sub-studies provided some valuable findings, based on which changes and improvements could be made in future studies to explore the phenomena from other angles. Methodologically, this thesis took a mainly quantitative approach. The items were adapted to the specific research context, and the questionnaire was revealed as having good validity and reliability in the two research contexts. However, the questionnaire itself does not include a dimension to explore approaches to teaching and other related conceptions in varied cultural contexts. Items to explore participants' cultural backgrounds could be added to consider the variation of teaching and learning in different cultural and educational contexts. Meanwhile, the data were collected through teacher educators' self-report, thus, the study explored the reported practices of teacher educators rather than their actual behaviour. Future studies could consider qualitative research methodology. For instance, in addition to the questionnaire, researchers could add interviews and classroom observations to acquire more thorough and comprehensive data. Furthermore, although there were some comparative discussions on Finnish and Chinese teacher educators' reported approaches to teaching, the present study was not a comparative study. Comparative studies are suggested when the research aim is to know how teaching is related to contextual factors and varies in different teaching situations. Finally but importantly, concerning the small sample size, in future

research, researchers should consider the strategies to encourage participants' active participation in the study. For example, instant feedback on the research results could be given to the participants as soon as possible to promote their interests in the study topics.

The results revealed in this thesis provided some new dimensions that could be looked into further in future research. Firstly, the study revealed the ways teacher educators could integrate research into the teaching of one course. Further studies could focus on teacher educators' integration of research with the teaching of different courses (in different teaching situations). The changes in teacher educators' research-teaching integration over time in their different career phrases are also worth exploring. The future focus could be on explaining why they choose certain ways to integrate research and teaching. Secondly, previous findings indicated that the teacher-focused approach to teaching is less related to contextual factors (Prosser & Trigwell, 1997). Furthermore, *Study III* revealed that teacher self-efficacy beliefs in teaching and burnout could only explain little of the variance of the teacher-focused approach. Thus, other factors that might influence teacher educators' approaches to teaching should be explored; especially the factors affecting teacher educators' adoption of the teacher-focused approach to teaching. Thirdly, two dimensions constructed the burnout scale in this study. The complicated relationships were revealed between teacher educators' experiences of inadequacy in interaction with students and both their student-focused and teacher-focused approaches to teaching (both were positive relationships). Meanwhile, as an important dimension of burnout, exhaustion was revealed to have no influence on either the student-focused or the teacher-focused approach to teaching. Hence, further investigations on how teacher educators' burnout could influence their approaches to teaching are heartily recommended. Furthermore, previous studies indicated that pedagogical training positively influences teachers' approaches to teaching to be more student-focused (Postareff et al., 2007). Future studies could focus on how pedagogical training affects teacher educators' adoption of the student-focused approach to teaching, while reducing their experiences of inadequacy when interacting with students. Finally, as an interactive practice, teacher educators' teaching can never leave the other part of the subject, i.e., the student teachers. One thing that should be considered is that teacher educators are teaching student teachers about how to teach and how to be teachers in the future. Thus, besides exploring the issues from the above-mentioned teacher educators' point of view, future research could also look into the student teachers' perceptions and experiences when their teachers approach research and teaching work in different ways.

References

Allinder, R. M. (1994). The relationship between efficacy and the instructional practices of special education teachers and consultants. *Teacher Education and Special Education*, 17(2), 86-95.

Archibald, M. M. (2016). Investigator triangulation: A collaborative strategy with potential for mixed methods research. *Journal of Mixed Methods Research*, 10(3), 228-250.

Ashton, P. T., Webb, R. B., & Doda, N. (1983). *A study of teachers' sense of efficacy*. Final report, Executive summary. Gainesville: University of Florida.

Aspfors, J., & Eklund, G. (2017). Explicit and implicit perspectives on research-based teacher education: Newly qualified teachers' experiences in Finland. *Journal of Education for Teaching*, 43(4), 400-413.

Attri, A. K., & Devi, N. (2017). Relationship between professional commitment and self-efficacy of secondary teacher educators. *International Journal of Advanced Education and Research*, 2(4), 42-44.

Åkerlind, G. S. (2003). Growing and developing as a university teacher—variation in meaning. *Studies in Higher Education*, 28(4), 375-390.

Ball, D. L., & Forzani, F. M. (2009). The work of teaching and the challenge for teacher education. *Journal of Teacher Education*, 60(5), 497-511.

Bandura, A. (1993). Perceived self-efficacy in cognitive development and functioning. *Educational Psychologist*, 28(2), 117-148.

Bandura, A. (1994). Self-efficacy. In V. S. Ramachaudran (Eds.), *Encyclopedia of human behavior* (pp. 71-81). New York: Academic Press.

Barrett, M. (2000). Practical and ethical issues in planning research. In G. M. Breakwell, S. Hammond, & C. Fife-Schaw (Eds.), *Research methods in psychology* (2nd ed.) (pp. 22-40). London: SAGE Publication.

Beausaert, S. A. J., Segers, M. S. R., & Wiltink, D. P. A. (2013). The influence of teachers' teaching approaches on students' learning approaches: The student perspective. *Educational Research*, 55(1), 1-15.

Belo, N. A. H., Van Driel, J. H., Van Veen, K., & Verloop, N. (2014). Beyond the dichotomy of teacher- versus student-focused education: A survey study on physics teachers' beliefs about the goals and pedagogy of physics education. *Teaching and Teacher Education*, 39, 89-101.

Ben-Peretz, M. (2001). The impossible role of teacher educators in a changing world. *Journal of Teacher Education*, 52(1), 48-56.

Berry, A. (2004). Self study in teaching about teaching. In J. J. Loughran, M. L. Hamilton, V. K. LaBoskey, & T. Russell (Eds.), *International handbook*

of self-study of teaching and teacher education practices (pp. 1295-1332). Dordrecht: Springer.

Berry, A. (2009). Professional self-understanding as expertise in teaching about teaching. *Teachers and teaching*, 15(2), 305-318.

Berry, A., & Loughran, J. (2012). Developing science teacher educators' pedagogy of teacher education. In B. Fraser, K. Tobin, & C. McRobbie (Eds.), *Second international handbook of science education* (pp. 401-415). Dordrecht, Springer.

Betoret, F. D. (2006). Stressors, self-efficacy, coping resources, and burnout among secondary school teachers in Spain. *Educational Psychology*, 26(4), 519-539.

Biglan, A. (1973a). The characteristics of subject matter in different academic areas. *Journal of Applied Psychology*, 57(3), 195-203.

Biglan, A. (1973b). Relationships between subject matter characteristics and the structure and output of university departments. *Journal of Applied Psychology*, 57(3), 204-213.

Brew, A. (1998). Research as it is experienced: Implications for higher education. Paper presented at the Higher Education Research and Development Society of Australasia Conference, Auckland, New Zealand.

Brew, A. (1999). Research and teaching: Changing relationships in a changing context. *Studies in Higher Education*, 24(3), 291-301.

Brew, A. (2002). Research and the academic developer: A new agenda. *The International Journal for Academic Development*, 7(2), 112-122.

Brew, A. (2003). Teaching and Research: New relationships and their implications for inquiry-based teaching and learning in higher education. *Higher Education Research & Development*, 22(1), 3-18.

Brew, A. (2010). Imperatives and challenges in integrating teaching and research. *Higher Education Research & Development*, 29(2), 139-150.

Brew, A., & Boud, D. (1995). Teaching and research: Establishing the vital link with learning. *Higher Education*, 29, 261-273.

Brew, A., & Phillis, F. (1997). How is research changing? Conceptions of successful researchers. *Research and Development in Higher Education*, 20, 131-135.

Brewer, E. W., & McMahan, J. (2003). Job stress and burnout among industrial and technical teacher educators. *Journal of Vocational Education Research*, 28(2), 125-140.

Brewer, E., & McMahan-Landers, J. (2003). The relationship between job stress and job satisfaction among industrial and technical teacher educators. *Journal of Career and Technical Education*, 20(1), 37-50.

Burgess, R. G. (Eds.). (2005). *The ethics of educational research*. New York: The Falmer Press.

Byman, R., Krokfors, L., Toom, A., Maaranen, K., Jyrhämä, R., Kynäslahti, H., & Kansanen, P. (2009). Educating inquiry-oriented teachers: Students' attitudes and experiences towards research-based teacher education. *Educational Research and Evaluation*, 15(1), 79-92.

Caprara, G. V., Barbaranelli, C., Steca, P., & Malone, P. S. (2006). Teachers' self-efficacy beliefs as determinants of job satisfaction and students' academic achievement: A study at the school level. *Journal of School Psychology*, 44(6), 473-490.

Cattell, R. B. (1966). The scree test for the number of factors. *Multivariate Behavioral Research*, 1(2), 245-276.

Celik, S. (2011). Characteristics and competencies for teacher educators: Addressing the need for improved professional standards in Turkey. *Australian Journal of Teacher Education*, 36(4), 73-87.

Chamberlain, G. P. (2006). Researching strategy formation process: An abductive methodology. *Quality & Quantity*, 40, 289-301.

Chan, K., & Elliott, R. G. (2002). Exploratory study of Hong Kong teacher education students' epistemological beliefs: Cultural perspectives and implications on beliefs research. *Contemporary Educational Psychology*, 27(3), 392-414.

Chan, K. K. C., & Rao, N. (Eds.). (2009). *Revisiting the Chinese learner: Changing contexts, changing education*. Hong Kong: Springer and Comparative Education Research Centre, University of Hong Kong.

Chang, Y. (2015). Examining relationships among elementary mathematics teacher efficacy and their students' mathematics self-efficacy and achievement. *Eurasia Journal of Mathematics, Science and Technology Education*, 11(6), 1307-1320.

Chen, J. (2015). Teachers' conceptions of approaches to teaching: A Chinese perspective. *The Asia-Pacific Education Researcher*, 24(2), 341-451.

Chichekian, T., & Shore, B. M. (2016). Preservice and practicing teachers' self-efficacy for inquiry-based instruction. *Cogent Education*, 3(1), 1-19.

Choi, J., Lee, J-H., & Kim, B. (2019). How does learner-centred education affect teacher self-efficacy? The case of project-based learning in Korea. *Teaching and Teacher Education*, 85, 45-57.

Coate, K., Barnett, R., & Williams, G. (2001). Relationships between teaching and research in higher education in England. *Higher Education Quarterly*, 55(2), 158-174.

Cochran-Smith, M. (2005). Teacher educators as researchers: Multiple perspectives. *Teaching and Teacher Education*, 21(2), 219-225.

Cohen, L., Manion, L., & Morrison, K. (2007). *Research methods in education* (6th ed.). London and New York: Routledge. Retrieved from https://gtu.ge/Agro-Lib/RESEARCH%20METHOD%20COHEN%20ok.pdf.

Coladarci, T. (1992). Teachers' sense of efficacy and commitment to teaching. *The Journal of Experimental Education*, 60(4), 323-337.

Colbeck, C. L. (1998). Merging in a seamless blend: How faculty integrate teaching and research. *The Journal of Higher Education*, 69(6), 647-671.

Costello, A. B., & Osborne, J. W. (2005). Best practices in exploratory factor analysis: Four recommendations for getting the most from your analysis. *Practical Assessment, Research & Evaluation*, 10(7), 1-9.

Creswell, J. W., & Miller, D. L. (2000). Determining validity in qualitative inquiry. *Theory into Practice*, 39(3), 124-130.

Dai, W., & Goodwin, L. (2013). Research on the impact of Chinese teacher preparation reform on teacher candidates' quality after the 1990s. In X. Zhu, & K. Zeichner (Eds.), *Preparing teachers for the 21st century* (pp. 201-213). Berlin, Germany: Springer-Verlag Berlin Heidelberg.

Davison, J., Murray, J., & John, P. (2005). Teacher educators' academic and professional identities: Faculty and student perspectives. Paper presented at the 30th Annual Conference of the Association for Teacher Education in Europe, Amsterdam.

Dengerink, J., Lunenberg, M., & Korthagen, F. (2015). The professional teacher educator: Six roles. *Beiträge zur Lehrerinnen- und Lehrerbildung*, 33(3), 334-344.

Dinkelman, T. (2003). Self-study in teacher education: A means and ends tool for promoting reflective teaching. *Journal of Teacher Education*, 54(1), 6-18.

Dixon, F. A., Yssel, N., McConnell, J. M., & Hardin, T. (2014). Differentiated instruction, professional development, and teacher efficacy. *Journal for the Education of the Gifted*, 37(2), 111-127.

Dorman, J. P. (2003). Relationship between school and classroom environment and teacher burnout: A LISREL analysis. *Social Psychology of Education*, 6(2), 107-127.

Driscoll, D. L., Appiah-Yeboah, A., Salib, P., & Rupert, D. J. (2007). Merging qualitative and quantitative data in mixed methods research: How to and why not. *Ecological and Environmental Anthropology*, 3(1), 19-28.

Elen, J., Lindblom-Ylänne, S., & Clement, M. (2007). Faculty development in research-intensive universities: The role of academics' conceptions on the relationship between research and teaching. *International Journal for Academic Development*, 12(2), 123-139.

Eley, M. G. (2006). Teachers' conceptions of teaching, and the making of specific decisions in planning to teach. *Higher Education*, 51, 191-214.

Ellis, V., Glackin, M., Heighes, D., Norman, M., Nicol, S., Norris, K., Spencer, I., & McNicholl, J. (2013). A difficult realisation: The proletarianisation of higher education-based teacher educators. *Journal of Education for Teaching*, 39(3), 266-280.

Ellis, V., McNicholl, J., Blake, A., & McNally, J. (2014). Academic work and proletarianisation: A study of higher education-based teacher educators. *Teaching and Teacher Education*, 40, 33-43.

Elo, S., Kääriäinen, M., Kanste, O., Pölkki, T., Utriainen, K., & Kyngäs, H. (2014). Qualitative content analysis: A focus on trustworthiness. *Sage Open*, 4(1), 1-10. doi: 10.1177/2158244014522633.

Elo, A., Leppänen, A., & Jahkola, A. (2003). Validity of a single-item measure of stress symptoms. *Scandinavian Journal of Work, Environment & Health*, 29(6), 444-451.

Entwistle, N., Skinner, D., Entwistle, D., & Orr, S. (2000). Conceptions and beliefs about "good teaching": An integration of contrasting research areas. *Higher Education Research & Development*, 19(1), 5-26.

Esser, F., & Vliegenthart, R. (2017). Comparative research methods. In J. Matthes, C. S. Davis, & R. F. Potter (Eds.), *The international encyclopedia of communication research methods* (pp. 1-22). London: Wiley-Blackwell.

European Commission. (2013). *Supporting teacher educators for better learning outcomes*. Brussels: European Commission.

Finnish Advisory Board on Research Integrity. (2012). *Responsible Conduct of Research and Procedures for Handling Allegations of Misconduct in Finland*. Retrieved from https://www.tenk.fi/sites/tenk.fi/files/HTK_ohje_2012.pdf.

Flores, M. A. (2018). Linking teaching and research in initial teacher education: Knowledge mobilisation and research-informed practice. *Journal of Education for Teaching*, 44(5), 621-636.

Freudenberger, H. J. (1974). Staff burn-out. *Journal of Social Issues*, 30(1), 195-165.

Friedman, I. A. (2003). Self-efficacy and burnout in teaching: The importance of interpersonal-relations efficacy. *Social Psychology of Education*, 6, 191-215.

Geerdink, G., Boei, F., Willemse, M., Kools, Q., & Van Vlokhoven, H. (2016). Fostering teacher educators' professional development in research and in supervising student teachers' research. *Teachers and Teaching*, 22(8), 965-982.

George, D., & Mallery, P. (2019). *IBM SPSS statistics 25 step by step: A simple guide and reference* (5th ed.). New York: Routledge.

Ghaith, G., & Yaghi, H. (1997). Relationships among experience, teacher efficacy, and attitudes toward the implementation of instructional innovation. *Teaching and Teacher Education*, 13(4), 451-458.

Gibbs, G., & Coffey, M. (2004). The impact of training of university teachers on their teaching skills, their approach to teaching and the approach to learning of their students. *Active Learning in Higher Education*, 5(1), 87-100.

Gibson, S., & Dembo, M. H. (1984). Teacher efficacy: A construct Validation. *Journal of Educational Psychology*, 76(4), 569-582.

Goh, P. S. C., Wong, K. T., & Hamzah, M. S. G. (2014). The Approaches to Teaching Inventory: A preliminary validation of the Malaysian translation. *Australian Journal of Teacher Education*, 39(1), 16-26.

Goodwin, A. L., Smith, L., Souto-Manning, M., Cheruvu, R., Tan, M. Y., Reed, R., & Taveras, L. (2014). What should teacher educators know and be able to do? Perspectives from practicing teacher educators. *Journal of Teacher Education*, 65(4), 248-302.

Gorski, P. C., Davis, S. N., & Reiter, A. (2012). Self-efficacy and multicultural teacher education in the United States: The factors that influence who feels qualified to be a multicultural teacher educator. *Multicultural Perspectives*, 14(4), 220-228.

Goubeaud K., & Yan, W. (2004). Teacher educators' teaching methods, assessments, and grading: A comparison of higher education faculty's instructional practices. *The Teacher Educator*, 40(1), 1-16.

Graneheim, U. H., & Lundman, B. (2004). Qualitative content analysis in nursing research: Concepts, procedures and measures to achieve trustworthiness. *Nurse Education Today*, 24(2), 105-112.

Grayson, J. L., & Alvarez, H. K. (2008). School climate factors relating to teacher burnout: A mediator model. *Teaching and Teacher Education*, 24(5), 1349-1363.

Green, A. (2003). Education, globalisation and the role of comparative research. *London Review of Education*, 1(2), 83-97.

Gregory, J., & Jones, R. (2009). 'Maintaining competence': A grounded theory typology of approaches to teaching in higher education. *Higher Education*, 57, 769-785.

Griffiths, R. (2004). Knowledge production and the research-teaching nexus: The case of the built environment disciplines. *Studies in Higher Education*, 29(6), 709-726.

Griffiths, V., Thompson, S., & Hryniewicz, L. (2010). Developing a research profile: Mentoring and support for teacher educators. *Professional Development in Education*, 36(1-2), 245-262.

Guberman, A., Ulvik, M., MacPhail, A., & Oolbekkink-Marchand, H. (2020). Teacher educators' professional trajectories: Evidence from Ireland, Israel, Norway and the Netherlands. *European Journal of Teacher Education*. doi: https://doi.org/10.1080/02619768.2020.1793948.

Guilfoyle, K., Hamilton, M. L., & Pinnegar, S. (1997). Obligations to unseen children. In J. Loughran, & T. Russell (Eds.), *Teaching about teaching: Purpose, passion and pedagogy in teacher education* (pp. 183-209). London: Falmer Press.

Gunn, A. C., Berg, D., Hill, M. F., & Haigh, M. (2015). Constructing the academic category of teacher educator in universities' recruitment processes in Aotearoa, New Zealand. *Journal of Education for Teaching*, 41(3), 307-320.

Gunn, A. C., Hill, M. F., Berg, D., & Haigh, M. (2016). The changing work of teacher educators in Aotearoa New Zealand: A view through activity theory. *Asia-Pacific Journal of Teacher Education*, 44(4), 306-319.

Guo, S. (2005). Exploring current issues in teacher education in China. *The Alberta Journal of Educational Research*, 51(1), 69-84.

Gupta, S., & Goswami, V. (2014). Is self-efficacy a key factor for effective teacher educators? *MIER Journal of Educational Studies, Trends and Practices*, 4(1), 101-110.

Guskey, T. R. (1988). Teacher efficacy, self-concept, and attitudes toward the implementation of instructional innovation. *Teaching and Teacher education*, 4(1), 63-69.

Haig, B. D. (2005). An abductive theory of scientific method. *Psychological Methods*, 10(4), 371-388.

Han, X. (2012). Big moves to improve the quality of teacher education in China. *On The Horizon*, 20(4), 324-335.

Han, J., Yin, H., & Wang, W. (2015). Exploring the relationship between goal orientations for teaching of tertiary teachers and their teaching approaches in China. *Asia Pacific Education Review*, 16, 537-547.

Hanbury, A., Prosser, M., & Rickinson, M. (2008). The differential impact of UK accredited teaching development programmes on academics' approaches to teaching. *Studies in Higher Education*, 33(4), 469-483.

Harland, T. (2016). Teaching to enhance research. *Higher Education Research & Development*, 35(3), 461-472.

Harshman, J., & Stains, M. (2017). A review and evaluation of the internal structure and consistency of the Approaches to Teaching Inventory. *International Journal of Science Education*, 39(7), 918-936.

Hattie, J., & Marsh, H. W. (1996). The relationship between research and teaching: A meta-analysis. *Review of Educational Research*, 66(4), 507-542.

Hattie, J., & Marsh, H. W. (2004). One journey to unravel the relationship between research and teaching. Paper presented at the International Colloquium on Research and Teaching: Closing the Divide? Winchester, UK. 17-19 March. Available from: https://www.semanticscholar.org/paper/ONE-JOURNEY-TO-UNRAVEL-THE-RELATIONSHIP-BETWEEN-AND-Hattie-Marsh/f7c0dcc67215262c2bc2402bc69f5bd7875f8abf.

Healey, M. (2005a). Linking research and teaching: Exploring disciplinary spaces and the role of inquiry-based learning. In R. Barnett (Eds.), *Reshaping the university: New relationships between research, scholarship and teaching* (pp. 67-78). UK: McGraw Hill/Open University Press.

Healey, M. (2005b). Linking research and teaching to benefit student learning. *Journal of Geography in Higher Education*, 29(2), 183-201.

Healey, M., & Jenkins, A. (2006). Strengthening the teaching-research linkage in undergraduate courses and programs. In C. Kreber (Eds.), *Exploring research-based teaching: New directions for teaching and learning* (pp. 45-55). San Francisco, CA: Jossey-Bass/Wiley.

Heikonen, L., Pietarinen, J., Pyhältö, K., Toom, A., & Soini, T. (2016). Earlier career teachers' sense of professional agency in the classroom: Associations with turnover intentions and perceived inadequacy in teacher-student interaction. *Asia-Pacific Journal of Teacher Education*, 45(3), 250-266.

Hickey, G., & Kipping, C. (1996). A multi-stage approach to the coding of data from open-ended questions. *Nurse Researcher*, 4 (1), 81-91.

Hill, M. F., & Haigh, M. A. (2012). Creating a culture of research in teacher education: Learning research within communities of practice. *Studies in Higher Education*, 37(8), 971-988.

Howard, S., & Johnson, B. (2004). Resilient teachers: Resisting stress and burnout. *Social Psychology of Education*, 7, 399-420.

Hu, Y., Van Der Rijst, R., Van Veen, K., & Verloop, N. (2014). 'And never the two shall meet'? Comparing Chinese and Dutch university teachers about the role of research in teaching. *Higher Education*, 68(4), 607-622.

Hu, Y., Van Der Rijst, R. M., Van Veen, K., & Verloop, N. (2019). Integrating research into language teaching: Beliefs and perceptions of university teachers. *Innovations in Education and Teaching International*, 56(5), 594-604.

Hunt, L., & Chalmers, D. (Eds.). (2013). *University teaching in focus: A learning-Centred approach*. New York: Routledge.

Hökkä, P., & Eteläpelto, A. (2014). Seeking new perspectives on the development of teacher education: A study of the Finnish context. *Journal of Teacher Education*, 65(1), 39-52.

Hökkä, P., Eteläpelto, A., & Rasku-Puttonen, H. (2012). The professional agency of teacher educators amid academic discourses. *Journal of Education for Teaching*, 38(1), 83-102.

Johnson, R. B., Onwuegbuzie, A. J., & Turner, L. A. (2007). Toward a definition of mixed methods research. *Journal of Mixed Methods Research*, 1(2), 112-133.

Jusoh, R., & Abidin, Z. Z. (2012). The teaching-research nexus: A study on the students' awareness, experiences and perceptions of research. *Procedia-Social and Behavioral Sciences*, 38, 141-148.

Jyrhämä, R., Kynäslahti, H., Krokfors, L., Byman, R., Maaranen, K., Toom, A., & Kansanen, P. (2008). The appreciation and realisation of research-based teacher education: Finnish students' experiences of teacher education. *European Journal of Teacher Education*, 31(1), 1-16.

Jyrhämä, R., & Maaranen, K. (2012). Research-orientation in a teacher's work. In H. Niemi, A. Toom, & A. Kallioniemi (Eds.), *The miracle of education: The principles and practices of teaching and learning in Finnish schools* (pp. 97-112). Rotterdam, Netherlands: Sense Publishers.

Kagan, D. M. (1992). Implication of research on teacher belief. *Educational Psychologist*, 27(1), 65-90.

Kansanen, P. (2003). Teacher education in Finland: Current models and new developments. In B. Moon, L. Vlăsceanu, & C. Barrows (Eds.), *Institutional approaches to teacher education within higher education in Europe: Current models and new developments* (pp. 85-108). Bucharest, Romania: Unesco–Cepes.

Kansanen, P. (2014). Teaching as a Master's level profession in Finland: Theoretical reflections and practical solutions. In O. McNamara, J. Murray, & M. Jones (Eds.), *Workplace learning in teacher education: International practice and policy* (pp. 279-292). New York: Springer.

Kaye, L. K., & Brewer, G. (2013). Teacher and student-focused approaches: Influence of learning approach and self-efficacy in a psychology postgraduate sample. *Psychology Learning & teaching*, 12(1), 12-19.

Kelchtermans, G., Smith, K., & Vanderlinde, R. (2018). Towards an 'international forum for teacher educator development': An agenda for research and action. *European Journal of Teacher Education*, 41(1), 120-134.

Kember, D. (1997). A reconceptualisation of the research into university academics' conceptions of teaching. *Learning and Instruction*, 7(3), 255-275.

Kember, D., & Kwan, K. P. (2000). Lecturers' approaches to teaching and their relationship to conceptions of good teaching. *Instructional Science*, 28, 469-490.

Kemp, S. J. (2013). Exploring the use of learner-focused teaching approaches in different academic disciplines. *Journal of Further and Higher Education*, 37(6), 804-818.

Klassen, R. M., Tze, V. M. C., Betts, S. M., & Gordon, K. A. (2011). Teacher efficacy research 1998-2009: Signs of progress of unfulfilled promise? *Educational Psychology Review*, 23, 21-43.

Kokkinos, C. M., Panayiotou, G., & Davazoglou, A. M. (2005). Correlates of teacher appraisals of student behaviors. *Psychology in the Schools*, 42(1), 79-89.

Korte, D. S., & Simonsen, J. C. (2018). Influence of social support on teacher self-efficacy in novice agricultural education teachers. *Journal of Agricultural Education*, 59(3), 100-123.

Korthagen, F. A. J., & Kessels, J. P. A. M. (1999). Linking theory and practice: Changing the pedagogy of teacher education. *Educational Researcher*, 28(4), 4-17.

Koster, B., Brekelmans, M., Korthagen, F., & Wubbels, T. (2005). Quality requirements for teacher educators. *Teaching and Teacher Education*, 21(2), 157-176.

Koster, B., & Dengerink, J. (2001). Towards a professional standard for Dutch teacher educators. *European Journal of Teacher Education*, 24(3), 343-354.

Krokfors, L., Kynäslahti, H., Stenberg, K., Toom, A., Maaranen, K., Jyrhämä, R., Byman, R., & Kansanen, P. (2011). Investigating Finnish teacher educators' views on research-based teacher education. *Teaching Education*, 22(1), 1-13.

Kumar, S., & Mellsop, G. (2013). Burnout: Gender aspect. In S. Bährer-Kohler (Eds.), *Burnout for experts: Prevention in the context of living and working* (pp. 99-117). New York: Springer US.

Kynäslahti, H., Kansanen, P., Jyrhämä, R., Krokfors, L., Maaranen, K., & Toom, A. (2006). The multimode programme as a variation of research-based teacher education. *Teaching and Teacher Education*, 22(2), 246-256.

Kyriacou, C. (1987). Teacher stress and burnout: An international review. *Educational Research*, 29(2), 146-152.

Lackritz, J. R. (2004). Exploring burnout among university faculty: Incidence performance, and demographic issues. *Teaching and Teacher Education*, 20, 713-729.

Lai, M., Du, P., & Li, L. (2014). Struggling to handle teaching and research: A study on academic work at select universities in the Chinese Mainland. *Teaching in Higher Education*, 19(8), 966-979.

Lamote, C., & Engels, N. (2010). The development of student teachers' professional identity. *European Journal of Teacher Education*, 33(1), 3-18.

Lau, P. S. Y., Yuen, M. T., & Chan, R. M. C. (2005). Do demographic characteristics make a difference to burnout among Hong Kong secondary school teachers? *Social Indicators Research*, 71, 491-516.

Leung, D. Y. P., & Lee, W. W. S. (2006). Predicting intention to quit among Chinese teachers: Differential predictability of the components of burnout. *Anxiety, Stress & Coping*, 19(2), 129-141.

Leung, M., Lu, X., Chen, D., & Lu, M. (2008). Impacts of teaching approaches on learning approaches of construction engineering students: A comparative study between Hong Kong and mainland China. *Journal of Engineering Education*, 97, 135-145.

Li, M. (2010). From teacher-education university to comprehensive university: Case studies of East China Normal University, Southwest University and Yanbian University. *Frontiers of Education in China*, 5(4), 507-530.

Li, J. (2012). The Chinese model of teacher education: Retrospects and prospects over a century. *Frontiers of Education in China*, 07(3), 417-442.

Li, X., & Cutting, J. (2011). Rote learning in Chinese culture: Reflecting active Confucian-based memory strategies. In L. Jin, & M. Cortazzi, (Eds.), *Researching Chinese learners* (pp. 21-42). London: Palgrave Macmillan.

Li, Q., Zhu, X., & Lo, L. N. K. (2019). Teacher education and teaching in China. *Teachers and Teaching*, 25(7), 753-756.

Lindblom-Ylänne, S., Trigwell, K., Nevgi, A., & Ashwin, P. (2006). How approaches to teaching are affected by discipline and teaching context. *Studies in Higher Education*, 31(3), 285-298.

Lo, N. K. L. (2019). Teachers and teaching in China: A critical reflection. *Teachers and Teaching*, 25, 553-573.

Lortie, D. (1975). *Schoolteacher: A sociological study*. Chicago: University of Chicago Press.

Loughran, J., & Berry, A. (2005). Modelling by teacher educators. *Teaching and Teacher Education*, 21(2), 193-203.

Lu, X. (2019). The historical thread and analysis of teacher education policy in the past 70 years of new China. *Canadian Social Science*, 15(4), 62-70.

Lumpe, A., Vaughn, A., Henrikson, R., & Bishop, D. (2014). Teacher professional development and self-efficacy beliefs. In R. Evans, J. Luft, C. Czerniak, & C. Pea (Eds.), *The Role of Teachers' beliefs in International Classrooms* (pp. 49-63). Netherlands, Rotterdam: Sense Publishers.

Lunenberg, M. (2010). Characteristics, scholarship and research of teacher educators. In P. Peterson, E. Baker, & B. McGaw (Eds.), *International encyclopedia of education* (pp. 676-680). Oxford, UK: Elsevier.

Lunenberg, M., & Korthagen, F. (2003). Teacher educators and student-directed learning. *Teaching and Teacher Education*, 19(1), 29-44.

Lunenberg, M., Korthagen, F., & Swennen, A. (2007). The teacher educator as a role model. *Teaching and Teacher Education*, 23(5), 586-601.

Lunenberg, M., Ponte, P., & Van De Ven, P. (2007). Why shouldn't teachers and teacher educators conduct research on their own practices? An epistemological exploration. *European Educational Research Journal*, 6(1), 13-24.

Lunenberg, M., & Willemse, M. (2006). Research and professional development of teacher educators. *European Journal of Teacher Education*, 29(1), 81-98.

MacPhail, A., & O'Sullivan, M. (2019). Challenges for Irish teacher educators in being active users and producers of research. *European Journal of Teacher Education*, 42(4), 492-506.

MacPhail, A., Ulvik, M., Guberman, A., Czerniawski, G., Oolbekkink-Marchand, H., & Bain, Y. (2019). The professional development of higher education-based teacher educators: Needs and realities. *Professional Development in Education*, 45(5), 848-861.

Malderez, A., Hobson, A. J., Tracey, L., & Kerr, K. (2007). Becoming a student teacher: Core features of the experience. *European Journal of Teacher Education*, 30(3), 225-248.

Malinen, O., Savolainen, H., Engelbrecht, P., Xu, J., Nel, M., Nel, N., & Tlale, D. (2013). Exploring teacher self-efficacy for inclusive practices in three diverse countries. *Teaching and Teacher Education*, 33, 34-44.

Mameli, C., & Molinari, L. (2017). Teaching interactive practices and burnout: A study on Italian teachers. *European Journal of Psychology of Education*, 32, 219-234.

Martin, G. A. (1997). Teachers or researchers? The perceptions of professional role among university lectures. *Innovations in Education and Training International*, 34(2), 154-159.

Martinez, K. (2008). Academic induction for teacher educators. *Asia-Pacific Journal of Teacher Education*, 36(1), 35-51.

Maslach, C. (2003). Job burnout: New directions in research and intervention. *Current Directions in Psychological Science*, 12(5), 189-192.

Maslach, C., & Goldberg, J. (1998). Prevention of burnout: New perspectives. *Applied and Preventive Psychology*, 7(1), 63-74.

Maslach, C., & Jackson, S. E. (1981). The measurement of experienced burnout. *Journal of Occupational Behavior*, 2, 99-113.

Maslach, C., Schaufeli, W. B., & Leiter, M. P. (2001). Job burnout. *Annual Review of Psychology*, 52, 397-422.

McGeary, C. A., & McGeary, D. D. (2012). Occupational burnout. In R. J. Gatchel, & I. Z. Schultz (Eds.), *Handbook of occupational health and wellness* (pp. 181-200). New York: Springer.

McMahon, M., Forde, C., & Dickson, B. (2015). Reshaping teacher education through the professional continuum. *Educational Review*, 67(2), 158-178.

McNicholl J., & Blake, A. (2013). Transforming teacher education, an activity theory analysis. *Journal of Education for Teaching*, 39(3), 281-300.

Meyer, J. H. F., & Eley, M. G. (2006). The Approaches to Teaching Inventory: A critique of its development and applicability. *British Journal of Educational Psychology*, 76(3), 633-649.

Ministry of Education of the People's Republic of China. (1993). *教师法 [The Law of Teachers of the People's Republic of China]*. Retrieved from http://old.moe.gov.cn//publicfiles/business/html-files/moe/moe_619/200407/1314.html.

Ministry of Education of the People's Republic of China. (1995). *教师资格条例 [Ordinance of Teacher Qualification]*. Retrieved from http://old.moe.gov.cn/publicfiles/business/html-files/moe/moe_620/200409/3178.html.

Ministry of Education of the People's Republic of China. (2011). *教师教育课程标准 [Teacher Education Curriculum Standards]*. Retrieved from http://www.moe.gov.cn/srcsite/A10/s6991/201110/t20111008_145604.html.

Ministry of Education of the People's Republic of China. (2019). *教师教育基本情况介绍 [Introduction to the basic situation of teacher education]*. Retrieved from http://www.moe.gov.cn/fbh/live/2019/51106/sfcl/201909/t20190903_397022.html.

Mojavezi, A., & Tamiz, M. P. (2012). The impact of teacher self-efficacy on the students' motivation and achievement. *Theory and Practice in Language Studies*, 2(3), 483-491.

Mok, I. A. C. (2005). Shedding light on the East Asian learner paradox: Reconstructing student-centredness in a Shanghai classroom. *Asia Pacific Journal of Education*, 26(2), 131-142.

Monroy, F., González-Geraldo, J. L., & Hernández-Pina, F. (2015). A psychometric analysis of the Approaches to Teaching Inventory (ATI) and a proposal for a Spanish version (S-ATI-20). *Anales De Psicología/Annals of Psychology*, 31(1), 172-183.

Moon, B. (Eds.). (2016). *Do universities have a role in the education and training of teachers? An international analysis of policy and practice*. Cambridge: Cambridge University Press.

Murray, J. (1998). Integration or dichotomy of teaching and research? A case study of primary initial teacher educators. *Teachers and Teaching*, 4(1), 143-160.

Murray, J., Czerniawski, G., & Barber, P. (2011). Teacher educators' identities and work in England at the beginning of the second decade of the twenty-first century. *Journal of Education for Teaching*, 37(3), 261-277.

Murray, J., Swennen, A., & Shagrir, L. (2009). Understanding teacher educators' work and identities. In A. Swennen, & M. Van Der Klink (Eds.), *Becoming a teacher educator: Theory and Practice for Teacher Educators* (pp. 29-43). Dordrecht: Springer.

Murray, J., & Vanassche, E. (2019). Research capacity building in and on teacher education: Developing practice and learning. *Nordic Journal of Education and Practice*, 13(2), 114-129.

Nagra, V., & Arora, S. (2013). Occupational stress and health among teacher educators. *International Journal of Advanced Research in Management and Social Sciences*, 2(8), 1-13.

Nettle, E. B. (1998). Stability and change in the beliefs of student teachers during practice teaching. *Teaching and Teacher Education*, 14(2), 193-204.

Neumann, R. (1992). Perceptions of the teaching-research nexus: A framework for analysis. *Higher Education*, 23, 159-171.

Neumann, R. (1994). The teaching-research nexus: Applying a framework to university students' learning experiences. *European Journal of Education*, 29(3), 323-338.

Neumann, S., Parry, S., & Becher, T. (2002). Teaching and learning in their disciplinary contexts: A conceptual analysis. *Studies in Higher Education*, 27(4), 405-417.

Nie, Y., Tan, G. H., Liau, A. K., Lau, S., & Chua, B. L. (2013). The roles of teacher efficacy in instructional innovation: Its predictive relations to constructivist and didactic instruction. *Educational Research for Policy and Practice*, 12, 67-77.

Niemi, H. (2016). Academic and practical: Research-based teacher education in Finland. In B. Moon (Eds.), *Do universities have a role in the education and training of teachers: An international analysis of policy and practice* (pp. 19-33). Cambridge: Cambridge University Press.

Niemi, H., & Jakku-Sihvonen, R. (2011). Teacher education in Finland. In M. V. Zuljan, & J. Vogrinc (Eds.), *European dimensions of teacher education-Similarities and differences* (pp. 33-51). Slovenia: University of Ljubljana & Faculty of Education and the National School of Leadership in Education. Retrieved from http://ukviz.solazaravnatelje.si/ISBN/978-961-253-058-7/files/978-961-253-058-7.pdf#page=33.

Niemi, H., & Nevgi, A. (2014). Research studies and active learning promoting professional competences in Finnish teacher education. *Teaching and Teacher Education*, 43, 131-142.

Niemi, H., Toom, A., & Kallioniemi, A. (Eds.). (2012). *Miracle of education: The principles and practices of teaching and learning in Finnish schools*. Rotterdam: Sense Publishers.

Onwuegbuzie, A. J., & Leech, N. L. (2004). Enhancing the interpretation of "significant" findings: The role of mixed methods research. *The Qualitative Report*, 9(4), 770-792.

Osborn, M. (2004). New methodologies for comparative research? Establishing 'constants' and 'contexts' in educational experience. *Oxford Review of Education*, 30(2), 265-285.

Pan, W., Cotton, D., & Murray, P. (2014). Linking research and teaching: Context, conflict and complementarity. *Innovations in Education and Teaching International*, 51(1), 3-14.

Perera, H. N., Calkins, C., & Part, R. (2019). Teacher self-efficacy profiles: Determinants, outcomes, and generalizability across teaching level. *Contemporary Educational Psychology*, 58, 186-203.

Pickvance, C. (2005). The four varieties of comparative analysis: The case of environmental regulation. Paper for conference on small and large-n comparative solutions, University of Sussex, Brighton, UK.

Pietarinen, J., Pyhältö, K., Soini, T., & Salmela-Aro, K. (2013a). Reducing teacher burnout: A socio-contextual approach. *Teaching and Teacher Education*, 35, 62-72.

Pietarinen, J., Pyhältö, K., Soini, T., & Salmela-Aro, K. (2013b). Validity and reliability of the socio-contextual teacher burnout inventory (STBI). *Psychology*, 4(1), 73-82.

Pines, A. M., & Keinan, G. (2005). Stress and burnout: The significant difference. *Personality and Individual Differences*, 39(3), 625-635.

Pintrich, P. R., Smith, D. A., Garcia, T., & McKeachie, W. J. (1991). *A manual for the use of the motivated strategies for learning questionnaire (MSLQ)*. Ann Arbor, MI, National Centre for Research to Improve Postsecondary Teaching and Learning, University of Michigan.

Pitkäniemi, H. (2002). The relationship between teacher efficacy, instructional practice and student learning: How do they relate to each other? In K. Niinistö, H. Kukenilk, & L. Kemppinen (Eds.*), Developing teacher education in Estonia* (pp. 127-140). Turku, Estonia: Turun Yliopisto.

Posnanski, T. J. (2002). Professional development programs for elementary science teachers: An analysis of teacher self-efficacy beliefs and a professional development model. *Journal of Science Teacher Education*, 13(3), 189-220.

Postareff, L. (2007). *Teaching in higher education: From content-focused to learning-focused approaches to teaching* (Doctoral dissertation). University of Helsinki, Helsinki, Finland.

Postareff, L., Katajavuori, N., Lindblom-Ylänne, S., & Trigwell, K. (2008). Consonance and dissonance in descriptions of teaching of university teachers. *Studies in Higher Education*, 33(1), 49-61.

Postareff, L., & Lindblom-Ylänne, S. (2008). Variation in teachers' description of teaching: Broadening the understanding of teaching in higher education. *Learning and Instruction*, 18(2), 109-120.

Postareff, L., & Lindblom-Ylänne, S. (2011). Emotions and confidence within teaching in higher education. *Studies in Higher Education*, 36(7), 799-813.

Postareff, L., Lindblom-Ylänne, S., & Nevgi, A. (2007). The effect of pedagogical training on teaching in higher education. *Teaching and Teacher Education*, 23(5), 557-571.

Postareff, L., Lindblom-Ylänne, S., & Nevgi, A. (2008). A follow-up study of the effect of pedagogical training on teaching in higher education. *Higher Education*, 56, 29-43.

Prosser, M., Ramsden, P., Trigwell, K., & Martin, E. (2003). Dissonance in experience of teaching and its relation to the quality of student learning. *Studies in Higher Education*, 28(1), 37-48.

Prosser, M., & Trigwell, K. (1997). Relations between perceptions of the teaching environment and approaches to teaching. *British Journal of Educational Psychology*, 67, 25-35.

Prosser, M., & Trigwell, K. (2006). Confirmatory factor analysis of the Approaches to Teaching Inventory. *British Journal of Educational Psychology*, 76, 405-419.

Prosser, M., & Trigwell, K. (2014). Qualitative variation in approaches to university teaching and learning in large first-year classes. *Higher education*, 67, 783-795.

Päuler-Kuppinger, L., & Jucks, R. (2018). Out-of-class instruction in higher education: Impact of approaches to teaching and discipline. *International Journal of Higher Education*, 7(2), 199-209.

Qureshi, S., & Ullah, R. (2014). Learning experiences of higher education students: Approaches to learning as measures of quality of learning outcomes. *Bulletin of Education and Research*, 36(1), 79-100.

Rajendran, N., Watt, H. M. G., & Richardson, P. W. (2020). Teacher burnout and turnover intent. *The Australian Educational Researcher*, 47, 477-500.

Ramsden, P., & Moses, I. (1992). Associations between research and teaching in Australian higher education. *Higher Education*, 23, 273-295.

Rao, C. (2013). The reform and development of teacher education in China and Japan in an era of social change. In E. Kimonen, & R. Nevalainen (Eds.), *Transforming teachers' work globally: In search of a better way for schools and their communities* (pp. 261-301). Rotterdam, Netherlands: Sense Publishers.

Retelsdorf, J., Butler, R., Streblow, L., & Schiefele, U. (2010). Teachers' goal orientations for teaching: Associations with instructional practices, interest in teaching, and burnout. *Learning and Instruction*, 20(1), 30-46.

Richards, K. A. R., Hemphill, M. A., & Templin, T. J. (2018). Personal and contextual factors related to teachers' experience with stress and burnout. *Teachers and Teaching*, 24(7), 768-787.

Robertson, J. (2007). Beyond the 'research/teaching nexus': Exploring the complexity of academic experience. *Studies in Higher Education*, 32(5), 541-556.

Robertson, J., & Blackler, G. (2006). Students' experiences of learning in a research environment. *Higher Education Research & Development*, 25(3), 215-229.

Robinson, M., & McMillan, W. (2006). Who teaches the teachers? Identity, discourse and policy in teacher education. *Teaching and Teacher Education*, 22(3), 327-336.

Ross, J., & Bruce, C. (2007). Professional development effects on teacher efficacy: Results of a randomized field trial. *Journal of Educational Research*, 101(1), 50-60.

Salami, S. O. (2011). Job stress and burnout among lecturers: Personality and social support as moderators. *Asian Social Science*, 7(5), 110-121.

Sang, G., Valcke, M., Tondeur, J., Zhu, C., & Van Braak, J. (2012). Exploring the educational beliefs of primary education student teachers in the Chinese context. *Asia Pacific Education Review*, 13, 417-425.

Sarac, A., & Aslan-Tutak, F. (2017). The relationship between teacher efficacy, and students' trigonometry self-efficacy and achievement. *International Journal for Mathematics Teaching and Learning*, 18(1), 66-83.

Schepens, A., Aelterman, A., & Vlerick, P. (2009). Student teachers' professional identity formation: Between Being born as a teacher and becoming one. *Educational Studies*, 35(4), 361-378.

Schwarzer, R., & Hallum, S. (2008). Perceived teacher self-efficacy as a predictor of job stress and burnout: Mediation analyses. *Applied Psychology*, 57, 152-171.

Scott, S. B. (2019). *Factors influencing teacher burnout and retention strategies*. Honors Research Project. 798. Ohio: The University of Akron.

Shank, G. (1987). Abductive strategies in educational research. *The American Journal of Semiotics*, 5(2), 275-290.

Skaalvik, E. M., & Skaalvik, S. (2010). Teacher self-efficacy and teacher burnout: A study of relations. *Teaching and Teacher Education*, 26(4), 1059-1069.

Smith, K. (2005). Teacher educators' expertise: What do novice teachers and teacher educators say? *Teaching and Teacher Education*, 21(2), 177-192.

Smith, K. (2011). The multi-faced teacher educator: A Norwegian perspective. *Journal of Education for Teaching*, 37(3), 337-349.

Srinivasan, R. (2016). Teaching about teaching: Examining the pedagogy of teacher education in India. *Higher Education for the Future*, 3(2), 197-212.

Stemler, S. (2001). An overview of content analysis. *Practical Assessment, Research & Evaluation*, 7(17). Retrieved from https://scholarworks.umass.edu/cgi/viewcontent.cgi?article=1100&context=pare.

Stes, A., Clement, M., & Van Petegem, P. (2007). The effectiveness of a faculty training programme: Long-term and institutional impact. *International Journal for Academic Development*, 12(2), 99-109.

Stes, A., Coertjens, L., & Van Petegem, P. (2010). Instructional development for teachers in higher education: Impact on teaching approach. *Higher Education*, 60, 187-204.

Stes, A., Coertjens, L., & Van Petegem, P. (2013). Instructional development in higher education: Impact on teachers' teaching behaviour as perceived by students. *Instructional Science*, 41(6), 1103-1126.

Stes, A., De Maeyer, S., & Van Petegem, P. (2010). Approaches to teaching in higher education: Validation of a Dutch version of the Approaches to Teaching Inventory. *Learning Environments Research*, 13, 59-73.

Stes, A., Gijbels, D., & Van Petegem, P. (2008). Student-focused approaches to teaching in relation to context and teacher characteristics. *Higher Education*, 55, 255-267.

Stes, A., & Van Petegem, P. (2014). Profiling approaches to teaching in higher education: A cluster-analytic study. *Studies in Higher Education*, 39(4), 644-658.

Streiner, D. L. (2003). Starting at the beginning: An introduction to Coefficient Alpha and internal consistency. *Journal of Personality Assessment*, 80(1), 99-103.

Sutton, R. E., & Wheatley, K. F. (2003). Teachers' emotions and teaching: A review of the literature and directions for future research. *Educational Psychology Review*, 15(4), 327-358.

Swennen, A., Jones, K., & Volman, M. (2010). Teacher educators: Their identities, sub-identities and implications for professional development. *Professional Development in Education*, 36(1-2), 131-148.

Swennen, A., Lunenberg, M., & Korthagen, F. (2008). Preach what you teach! Teacher educators and congruent teaching. *Teachers and Teaching*, 14(5-6), 531-542.

Säntti, J., Puustinen, M., & Salminen, J. (2018). Theory and practice in Finnish teacher education: A rhetorical analysis of changing values from the 1960s to the present day. *Teachers and Teaching*, 24(1), 5-21.

Tabachnick, B. G., & Fidell, L. S. (2001). *Using multivariate statistics*. Boston: Allyn and Bacon.

Tack, H., & Vanderlinde, R. (2014). Teacher educators' professional development: Towards a typology of teacher educators' researcherly disposition. *British Journal of Educational Studies*, 62(3), 297-315.

Tack, H., & Vanderlinde, R. (2019). Capturing the relations between teacher educators' opportunities for professional growth, work pressure, work related basic needs satisfaction, and teacher educators' researcherly disposition. *European Journal of Teacher Education*, 42(4), 459-477.

Taimalu, M., Kikas, E., Hinn, M., & Niilo, A. (2010). Teachers' self-efficacy, teaching practices, and teaching approaches: Adaptation of scales and examining relations. In J. Mikk, M. Veisson, & P. Luik (Eds.), *Teacher's*

personality and professionalism (pp. 122-137). Frankfurt am Main: Peter Lang Publishers House.

Tan, C. (2015). Education policy borrowing and cultural scripts for teaching in China. *Comparative Education*, 51(2), 196-211.

Tan, C. (2017). Constructivism and pedagogical reform in China: Issues and challenges. *Globalisation, Societies and Education*, 15(2), 238-247.

Tan, C., & Chua, C. S. K. (2014). Education policy borrowing in China: Has the West wind overpowered the East wind? *Compare: A Journal of Comparative and International Education*, 45(5), 686-704.

Taylor-Powell, E., & Renner, M. (2003). Analyzing qualitative data. *Program Development & Evaluation*, 1(04), 1-12. Retrieved from https://deltastate.edu/docs/irp/Analyzing%20Qualitative%20Data.pdf.

Teichler, U., & Arimoto, A. (2014). Teaching and research: A vulnerable linkage? In J. Shin, A. Arimoto, W. Cummings, & U. Teichler (Eds.), *Teaching and research in contemporary higher education* (pp. 395-401). Dordrecht, Netherlands: Springer Netherlands.

Temiz, T., & Topcu, M. S. (2013). Preservice teachers' teacher efficacy beliefs and constructivist-based teaching practice. *European Journal of Psychology of Education*, 28(4), 1435-1452.

Tezci, E. (2017). Adaption of ATI-R scale to Turkish samples: Validity and reliability analyses. *International Education Studies*, 10(1), 67-81.

Tian, M., & Lu, G. (2017). What price the building of world-class universities? Academic pressure faced by young lecturers at a research-centred University in China, *Teaching in Higher Education*, 22(8), 957-974.

Timmermans, S., & Tavory, I. (2012). Theory construction in qualitative research: From grounded theory to abductive analysis. *Sociological Theory*, 30(3), 167-186.

Timoštšuk, I., & Ugaste, A. (2010). Student teachers' professional identity. *Teaching and Teacher Education*, 26(8), 1563-1570.

Timperley, H., Wilson, A., Barrar, H., & Fung, I. (2007). *Teacher professional learning and development: Best evidence synthesis iteration*. Wellington: Ministry of Education.

Tirri, K. (2014). The last 40 years in Finnish teacher education. *Journal of Education for Teaching*, 40(5), 600-609.

Tobery-Nystrom, J. C. (2011). *An exploration of self-efficacy in a teacher-educator's practice* (Doctoral dissertation). Retrieved from https://eric.ed.gov/?id=ED524380.

Tom, A. R. (1985). Inquiring into inquiry-oriented teacher education. *Journal of Teacher Education*, 36, 35-44.

Toom, A., & Husu, J. (2012). Finnish teachers as 'makers of the many': Balancing between broad pedagogical freedom and responsibility. In H. Niemi, A. Toom, & A. Kallioniemi (Eds.), *Miracle of education: The principle and*

practices of teaching and learning in Finnish schools (pp. 39-54). Rotterdam: Sense Publishers.

Toom, A., & Husu, J. (2018). Teacher's work in changing educational contexts: Balancing the role and the person. In H. Niemi, A. Toom, A. Kallioniemi, & J. Lavonen (Eds.), *The teacher's role in the changing globalizing world* (pp. 1-9). Leiden: Brill.

Toom, A., & Husu, J. (2021). Analyzing practice, research, and accountability turns in Finnish academic teacher education. In D. Mayer (Eds.), *Teacher education policy and research: Global perspectives*. Singapore: Springer.

Toom, A., Krokfors, L., Kynäslahti, H., Stenberg, K., Maaranen, K., Jyrhämä, R., Byman, R., & Kansanen, P. (2008). Exploring the essential characteristics of research-based teacher education from the viewpoint of teacher educators. In B. Åstrand, E. Eisenschmidt, B. Hudson, M. Lampere, & P. Zgaga (Eds.), *Proceedings of Second Annual Teacher Education Policy in Europe Network (TEPE) Conference: Mapping the landscape and looking to the future* (pp. 166-179). Retrieved from https://tuhat.halvi.helsinki.fi/portal/en/publications/exploring-the-essen(f0cc6fb4-b977-498f-803f-7981c5aa6775).html.

Toom, A., Kynäslahti, H., Krokfors, L., Jyrhämä, R., Byman, R., Stenberg, K., Maaranen, K., & Kansanen, P. (2010). Experiences of a research-based approach to teacher education: Suggestions for future policies. *European Journal of Education*, 45(2), 331-344.

Towers, J. (2010). Learning to teach mathematics through inquiry: A focus on the relationship between describing and enacting inquiry-oriented teaching. *Journal of Mathematics Teacher Education*, 13(3), 243-263.

Trigwell, K. (2012). Relations between teachers' emotions in teaching and their approaches to teaching in higher education. *Instructional Science*, 40, 607-621.

Trigwell, K., & Prosser, M. (1991). Improving the quality of student learning: The influence of learning context and student approaches to learning on learning outcomes. *Higher Education*, 22, 251-266.

Trigwell, K., & Prosser, M. (2004). Development and use of the Approaches to Teaching Inventory. *Educational Psychology Review*, 16, 409-424.

Trigwell, K., & Prosser, M. (2009). Using phenomenography to understand the research-teaching nexus. *Education as Change*, 13(2), 325-338.

Trigwell, K., Prosser, M., & Ginns, P. (2005). Phenomenographic pedagogy and a revised Approaches to teaching inventory. *Higher Education Research & Development*, 24(4), 349-360.

Trigwell, K., Prosser, M., & Taylor, P. (1994). Qualitative differences in approaches to teaching first year university science. *Higher Education*, 27, 75-84.

Trigwell, K., Prosser, M., & Waterhouse, F. (1999). Relations between teachers' approaches to teaching and students' approaches to learning. *Higher Education*, 37, 57-70.

Tryggvason, M. (2009). Why is Finnish teacher education successful? Some goals Finnish teacher educators have for their teaching. *European Journal of Teacher Education*, 32(4), 369-382.

Tryggvason, M. (2012). Perceptions of identity among Finnish university-based subject teacher educators. *European Journal of Teacher Education*, 35(3), 289-303.

Tschannen-Moran, M., & Hoy, A. W. (2001). Teacher efficacy: Capturing an elusive construct. *Teaching and Teacher Education*, 17(7), 783-805.

Tschannen-Moran, M., & Hoy, A. W. (2007). The differential antecedents of self-efficacy beliefs of novice and experienced teachers. *Teaching and Teacher Education*, 23(6), 944-956.

Tschannen-Moran, M., Hoy, A. W., & Hoy, W. K. (1998). Teacher efficacy: Its meaning and measure. *Review of Educational Research*, 68(2), 202-248.

Turner, P., & Turner, S. (2009). Triangulation in practice. *Virtual Reality*, 13, 171-181.

Uiboleht, K., Karm, M., & Postareff, L. (2016). How do university teachers combine different approaches to teaching in a specific course? A qualitative multi-case study. *Teaching in Higher Education*, 21(7), 854-869.

Uiboleht, K., Karm, M., & Postareff, L. (2018). The interplay between teachers' approaches to teaching, students' approaches to learning and learning outcomes: A qualitative multi-case study. *Learning Environments Research*, 21, 321-347.

Uusiautti, S., & Määttä, K. (2013). Significant trends in the development of Finnish teacher education programs (1860-2010). *Education Policy Analysis Archives*, 21(59), 1-22.

Vanassche, E., Kidd, W., & Murray, J. (2019). Articulating, reclaiming and celebrating the professionalism of teacher educators in England. *European Journal of Teacher Education*, 42(4), 478-491.

Vanassche, E., Rust, F., Conway, P. F., Smith, K., Tack, H., & Vanderlinde, R. (2015). InFo-TED: Bringing policy, research, and practice together around teacher educator development. In C. Craig, & L. Orland-Barak (Eds.), *International Teacher Education: Promising Pedagogies* (pp. 341-364). Brinkley: Emerald Books.

Van Der Klink, M., Kools, Q., Avissar, G., White, S., & Sakata, T. (2017). Professional development of teacher educators: What do they do? Findings from an explorative international study. *Professional Development in Education*, 43(2), 163-178.

Verburgh, A., Elen, J., & Lindblom-Ylänne, S. (2007). Investigating the myth of the relationship between teaching and research in higher education: A review of empirical research. *Studies in Philosophy and Education*, 26(5), 449-465.

Visser-Wijnveen, G. J., Van Driel, J. H., Van Der Rijst, R. M., Verloop, N., & Visser, A. (2010). The ideal research-teaching nexus in the eyes of academics: Building profiles. *Higher Education Research & Development*, 29(2), 195-210.

Visser-Wijnveen, G. J., Van Driel, J. H., Van Der Rijst, R. M., Visser, A., & Verloop, N. (2012). Relating academics' ways of integrating research and teaching to their students' perceptions. *Studies in Higher Education*, 37(2), 219-234.

Watkins, D. (2000). Learning and teaching: A cross-cultural perspective. *School Leadership & Management*, 20(2), 161-173.

Watkins, D. A., & Biggs, J. B. (Eds.). (1996). *The Chinese learner: Cultural, psychological, and contextual influences*. Hong Kong/Melbourne: Comparative Education Research Centre/Australian Council for Educational Research.

Watts, J., & Robertson, N. (2011). Burnout in university teaching staff: A systematic literature review. *Educational Research*, 53(1), 33-50.

Westbury, I., Hansén, S., Kansanen, P., & Björkvist, O. (2005). Teacher education for research-based practice in expanded roles: Finland's experience. *Scandinavian Journal of Educational Research*, 49(5), 475-485.

Wisniewski, L., & Gargiulo, R. M. (1997). Occupational stress and burnout among special educators: A review of the literature. *The Journal of Special Education*, 31(3), 325-346.

Wong, V. W., Ruble, L. A., Yu, Y., & McGrew, J. H. (2017). Too stressed to teach? Teaching quality, student engagement, and IEP outcomes. *Exceptional Children*, 83(4), 412-427.

Xu, L. (2019). Teacher-researcher role conflict and burnout among Chinese university teachers: A job demand-resources model perspective. *Studies in Higher Education*, 44(6), 903-919.

Yang, D., & Wu, J. (1999). Some issues in the reform and development of teacher education and training in China. *Teacher Development*, 3(2), 157-172.

Ye, J., Zhu, X., & Lo, L. N. K. (2019). Reform of teacher education in China: A survey of policies for systemic change. *Teachers and Teaching*, 25(7), 757-781.

Yogev, S., & Yogev, A. (2006). Teacher educators as researchers: A profile of research in Israeli teacher colleges versus university departments of education. *Teaching and Teacher Education*, 22(1), 32-41.

Yuan, R., & Lee, I. (2014). Understanding language teacher educators' professional experiences: An exploratory study in Hong Kong. *Asia Pacific Education Review*, 23(1), 143-149.

Zhang, L. (2001). Approaches and thinking styles in teaching. *The Journal of Psychology*, 135(5), 547-561.

Zhang, Z., & Zhou, X. (2011). Developing effective learning and teaching in higher education. *Journal of Language Teaching and Research*, 2(3), 709-713.

Zhou, J. (2014). Teacher education changes in China: 1974-2014. *Journal of Education for Teaching*, 40(5), 507-523.

Zhou, J., & Reed, L. (2005). Chinese government documents on teacher education since the 1980s. *Journal of Education for Teaching*, 31(3), 201-213.

Zhu, H. (2010). Curriculum reform and professional development: A case study on Chinese teacher educators. *Professional Development in Education*, 36(1-2), 373-391.

Zhu, G. (2017). Chinese student teachers' perspectives on becoming a teacher in the practicum: Emotional and ethical dimensions of identity shaping. *Journal of Education for Teaching*, 43(4), 491-495.

Zhu, X., & Han, X. (2006). Reconstruction of the teacher education system in China. *International Education Journal*, 7(1), 66-73.

Appendix A

Teacher Educators' Approaches to Teaching in Teacher Education

Part 1: Conceptions of teaching in teacher education

This part of the questionnaire is designed to explore the way that academics go about teaching in a specific context, subject or course. This may mean that your responses to these items in one context may be different to the responses you might make on your teaching in other contexts or subjects. For this reason we ask you to think of your most typical teaching situation and context while answering the questions.

Please name the subject/course of your response:_____

Please describe shortly the teaching situation/context (E.g. number and study level of the participants, teaching form and methods…).

_____
_____
_____
_____
_____

For each item please circle one of the numbers (1-5). The numbers stand for the following responses:

1 - This item was **only rarely or never** true for me in this subject.
2 - This item was **sometimes** true for me in this subject.
3 - This item was true for me **about half the time** in this subject.
4 - This item was **frequently** true for me in this subject.
5 - This item was **almost always or always** true for me in this subject.

Please answer each item. Do not spend a long time on each: your first reaction is probably the best one.

		only rarely				almost always
1.	In this course students should focus their study on what I provide them.	1	2	3	4	5
2.	It is important that the course is completely described in terms of specific objectives that relate to the assessment of the course.	1	2	3	4	5
3.	In this course I try to develop a conversation with my students about the topics we are studying.	1	2	3	4	5
4.	It is important to present a lot of facts to students so that they know what they have to learn for this subject.	1	2	3	4	5
5.	Dealing with problem situations considering my students often upsets me.	1	2	3	4	5

6.	I set aside some teaching time so that the students can discuss, among themselves, key concepts and ideas in this subject.	1	2	3	4	5
7.	In this course I concentrate on covering the information that might be available from key texts and readings.	1	2	3	4	5
8.	I encourage students to restructure their existing knowledge in terms of the new way of thinking about the subject that they will develop.	1	2	3	4	5
9.	I am confident that my knowledge of this subject matter is not a barrier to teaching it well.	1	2	3	4	5
10.	In teaching sessions for this subject, I deliberately provoke debate and discussion.	1	2	3	4	5
11.	I structure my teaching in this subject to help students to pass the assessment of the course.	1	2	3	4	5
12.	The challenging students make me question my abilities as a teacher.	1	2	3	4	5
13.	I think it is important to give students a good set of notes in this course.	1	2	3	4	5
14.	In this course, I provide the students with the information they will need to pass the formal assessments.	1	2	3	4	5
15.	I should know the answers to any questions that students may put to me during this course.	1	2	3	4	5
16.	I am certain that I have the necessary skills to teach this course.	1	2	3	4	5
17.	I make available opportunities for students in this course to discuss their changing understanding of the subject.	1	2	3	4	5
18.	It is better for students in this course to generate their own notes rather than copy mine.	1	2	3	4	5
19.	I often feel I have failed in my work with students.	1	2	3	4	5
20.	A lot of teaching time in this course should be used to question students' ideas.	1	2	3	4	5
21.	In this course my teaching focuses on the good presenting information to students.	1	2	3	4	5
22.	I am confident that students will learn from me in this course.	1	2	3	4	5
23.	I see teaching as helping students develop new ways of thinking in this subject.	1	2	3	4	5
24.	In teaching this subject it is important for me to monitor students' understanding of the subject matter.	1	2	3	4	5
25.	My teaching in this course focuses on delivering what I know to the students.	1	2	3	4	5

26.	I am confident that my knowledge of teaching is not a barrier to teaching well.	1	2	3	4	5
27.	Teaching in this course should help students question their own understanding of the subject matter.	1	2	3	4	5
28.	Teaching in this course should support students to find their own learning resources.	1	2	3	4	5
29.	I present material to enable students to build up an information base in this subject.	1	2	3	4	5

Part 2: Teacher educators' burnout in teacher education

This part of the questionnaire is to explore teacher educators' exhaustion and stress. For each item please circle one of the numbers (1-7) in which 1 represents **Completely disagree** to 7 represents **Completely agree**. (Please **note** that for the single stress item the scale is from **1 to 10**. 1 represents **Completely disagree** and 10 represents **Completely agree**.)

30. I feel burnt out. 1 2 3 4 5 6 7

31. With this work pace I don't think I will make it to the retiring age.

1 2 3 4 5 6 7

32. Stress means a situation in which a person feels tense, restless, nervous or anxious or is unable to sleep at night because his/her mind is troubled all the time. Do you feel this kind of work-related stress?

1 2 3 4 5 6 7 8 9 10

Part 3: The relationship between teaching and research

This part of the questionnaire is to explore the relationship between teaching and research of teacher educators, please answer the questions below.

33. How much do you think your research is related to your teaching?

1) There is no link between them.

2) They are loosely related.

3) They are partly related.

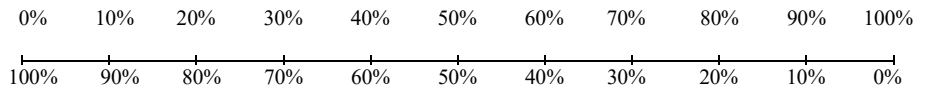
4) They are highly related.

5) They are totally related.

6) Other _____

34. To what extent do you consider yourself as a teacher and a researcher? Please choose **the number** that represents the percentages.

Teacher



Researcher

1 2 3 4 5 6 7 8 9 10 11

35. Please describe how you combine your research with your teaching; you can give specific examples here.

_____
_____
_____
_____
_____

Part 4: Background Information

I. Age: _____ years

II. Gender: 1. Male 2. Female

III. Where do you work?

1. The Department of Teacher Education 2. Teacher Training School

IV. If you work in the Department of Teacher Education, which programme/programmes are you in? (You can select more than one option.)
1. Class teacher education
2. Home economics teacher education
3. Kindergarten teacher education
4. Special needs education
5. Textiles teacher education
6. Subject teacher education

V. Job Title: 1. Lecturer 2. Adjunct Professor 3. Professor 4. Other _____

VI. Highest Degree: 1. Bachelor 2. Master 3. Doctor 4. Other _____

VII. Which tasks do your everyday work consist of? Describe an estimation in percentages. (**Please note that the total amount should be 100%**).
1. Teaching ___%
2. Research___%
3. Administration ___%
4. Others ___%

VIII. Years of teaching experience as a **teacher educator**: _____ years

IX. Do you have any **other teaching experience** other than being a teacher educator? If yes, please answer the questions below. If not, please answer the next question (X).

1. Where did you work before? (You can select more than one option)
   1) Kindergarten
   2) Primary school (1-6 grades)
   3) Junior high school (7-9 grades)
   4) Senior high school (10-12 grades)
   5) University (**not as a teacher educator**)
   6) Others _____
2. How long did it last? _____year(s)

X. Please answer the question about the pedagogical training that you participated in (If you participate in the pedagogical training more than once, please answer it according to the latest one).
   1. Do you have a formal teacher qualification? 1) Yes 2) No
   2. Have you participated in courses on university pedagogy? 1) Yes 2) No
   3. If yes, how many credits have you completed? _____credits

We would probably be willing to interview you based on this questionnaire in the future. If you would be able to participate in the interview, please write down your contact information.

Name: _____

E-mail Address: _____

Phone Number: _____

Thank you for your kind patience and cooperation!

ORIGINAL ARTICLES

ARTICLE I

This is an accepted manuscript of an article published by Taylor & Francis Group in European Journal of Teacher Education on 14 March 2021, available online: https://doi.org/10.1080/02619768.2021.1900111

Cao, Y., Postareff, L., Lindblom-Ylänne, S., & Toom, A. (2021). A survey research on Finnish teacher educators' research-teaching integration and its relationship with their approaches to teaching. *European Journal of Teacher Education*. https://doi.org/10.1080/02619768.2021.1900111

ARTICLE II

This article was published in Teaching and Teacher Education, 85, Cao, Y., Postareff, L., Lindblom-Ylänne, S., & Toom, A., Teacher educators' approaches to teaching and connections with their perceptions of the closeness of their research and teaching, 125-136, Copyright Elsevier (2019). https://doi.org/10.1016/j.tate.2019.06.013

Cao, Y., Postareff, L., Lindblom-Ylänne, S., & Toom, A. (2019). Teacher educators' approaches to teaching and connections with their perceptions of the closeness of their research and teaching. *Teaching and Teacher Education*, 85, 125-136. https://doi.org/10.1016/j.tate.2019.06.013

ARTICLE III

This is an accepted manuscript of an article published by Taylor & Francis Group in Journal of Education for Teaching on 15 March 2018, available online: https://doi.org/10.1080/02607476.2018.1450954

Cao, Y., Postareff, L., Lindblom, S., & Toom, A. (2018). Teacher educators' approaches to teaching and the nexus with self-efficacy and burnout: Examples from two teachers' universities in China. *Journal of Education for Teaching*, 44(4), 479-495. https://doi.org/10.1080/02607476.2018.1450954